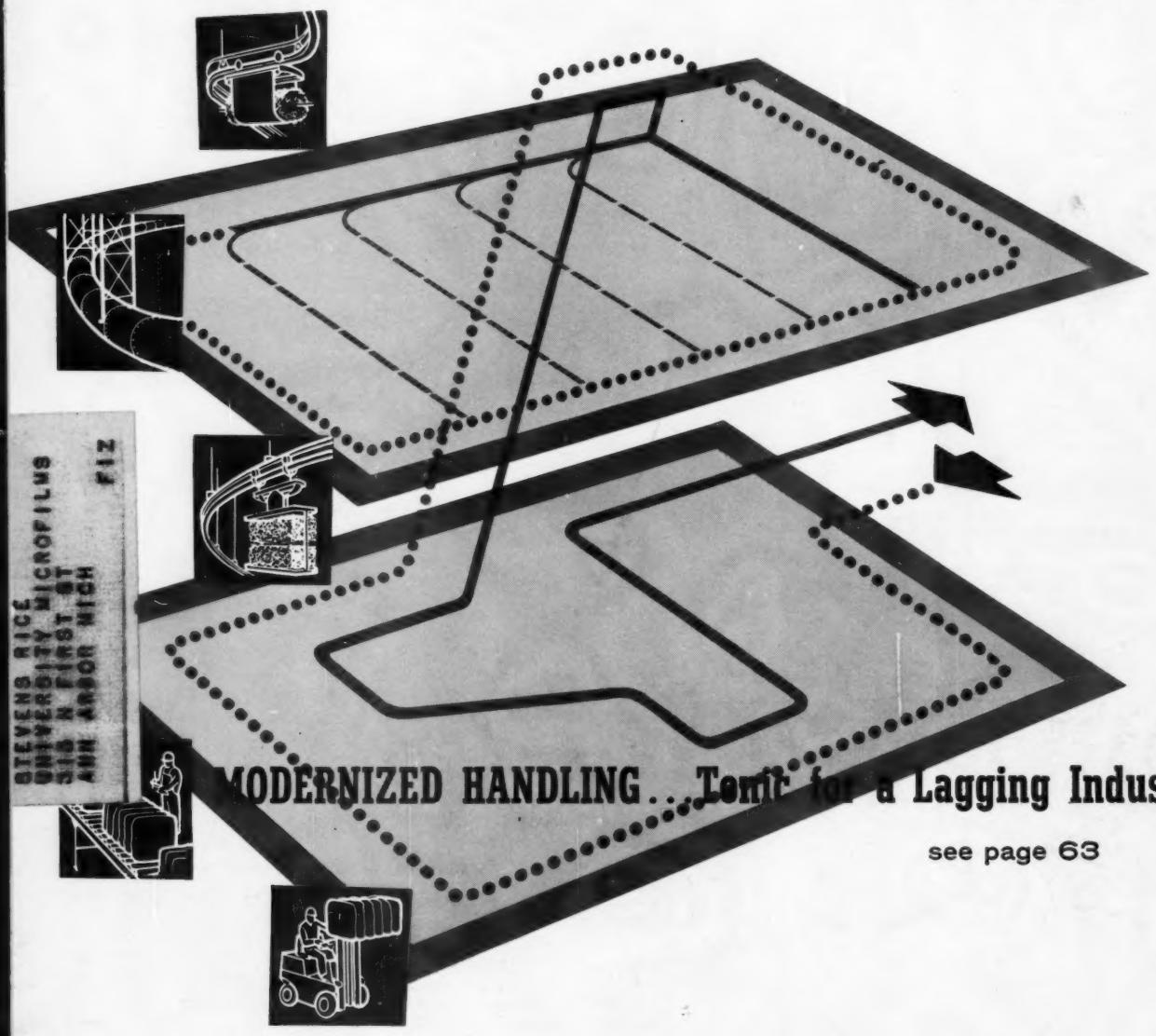
MATERIAL HANDLING

FLOW

PRODUCTION · AUTOMATION · PACKAGING · SHIPPING

MAY 1957

Trailer Carrying Vessels
Special Report . . . Page 116



STEVENS RICE
UNIVERSITY MICROFILMS
313 N FIRST ST
ANN ARBOR MICH
FIZ

MODERNIZED HANDLING . . . Tonic for a Lagging Industry

see page 63

. . . The FIRST magazine in the material handling industry.

- **The preferred reading of more than 40,000 identified buyers of material handling, packaging and shipping equipment and supplies**

FOR LOADS TO 5 TONS

NØELTING

Faultless CASTERS

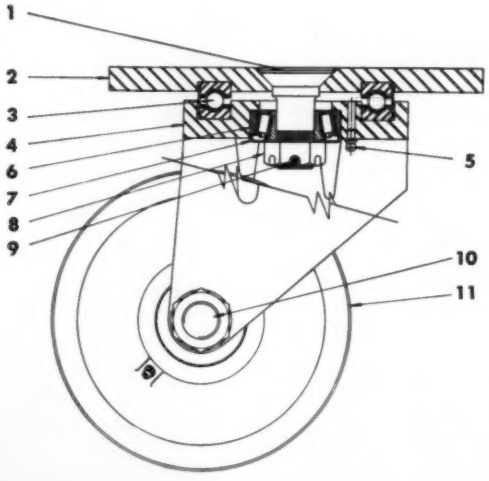
EXTRA HEAVY DUTY
SERIES HX300

Move Maximum Loads with Minimum Manpower

Here is the super strong Caster you have wanted for handling those loads that broke down ordinary Casters. Faultless Engineers combined their finest materials and designs to provide a caster capable of easily rolling under 10,000 pounds without injury. Under heaviest rated load conditions the new HX300 Caster keeps production lines moving with minimum handling costs. This heavily proportioned Caster has extra strength features at vital points, combined with ideally-suited bearing style and construction at all moving points. Timken tapered roller bearings and self-contained ball bearings provide free swivel and rolling movement even under loads of 5 tons per caster.

For further information on the Series HX300 Casters ask your nearby Faultless Industrial Distributor for Faultless form No. 6256. He also maintains a substantial inventory of Faultless Casters for immediate delivery. Call him today.

SERIES HX300
EXTRA HEAVY DUTY SWIVEL PLATE CASTER
Rated Load: 5 Tons per Caster



1. HEAVY, 1" DIAMETER KINGBOLT . . . threaded and double cross-hole drilled for adjustment with each 30° turn of slotted nut.

2. ⅝" THICK, STEEL TOP PLATE . . . accurately machined to receive self-contained main load bearing.

3. ½" DIAMETER, HARDENED BALLS . . . ground and hardened raceways. Completely dust-proof.

4. SOLID-STEEL 1" THICK LOWER TOP PLATE . . . accurately turned for self-contained ball race. Horn members are heavily corrugated for extra strength.

5. EASY, FAST LUBRICATION through pressure grease fittings.

6. INTERCHANGEABLE, TIMKEN LOAD BEARING . . . seats in machined recess in horn top plate.

7. COMBINATION DUST-GUARD AND GREASE SEAL . . . fully protects lower bearing from dirt, water and chemicals, and retains lubricant.

8. ADJUSTABLE, SLOTTED NUT.

9. HEAVY STEEL COTTER-PIN.

10. 1" DIAMETER AXLE BOLT . . . equipped with heavy nut and lock washer.

11. REINFORCED 8" OR 10" SEMI-STEEL WHEEL . . . Timken bearings protected with close fitting dust caps. V-Grooved wheels also available.

FAULTLESS CASTER CORPORATION, STANLYVILLE 7, INDIANA

Offices in Atlanta, Baltimore, Boston, Buffalo, Chicago, Cleveland, Dallas, Detroit, Grand Rapids, High Point, Indianapolis, Los Angeles, New Orleans, New York, Philadelphia, Pittsburgh, Seattle, St. Louis, Toronto, Stratford, Ontario

Circle No. 56 on Reader Service Card for more information

It's True!

2-Week Retread Service for Molded-On Solid Tires

HUB TYPE or spoke wheels – when the tread rubber of your industrial tire wears down, you don't have to replace the entire molded-on wheel. Instead, the used wheel can be shipped to Goodyear for application of a new tread.

Two weeks in our factory is all it takes.

Here's how to do it: **1.** Ready the wheels for shipment–remove bearings, races, washers and grease fittings–then turn them over to your Goodyear dealer for shipment to Goodyear Akron.

2. When we receive your wheels, we burn off the old rubber, shot blast the wheels and inspect them thoroughly. Next, we carefully weigh out the new rubber for each wheel and mold it on to factory specifications.

3. We ship your reconditioned wheels back to the Goodyear dealer, for delivery to you.

Call your Goodyear dealer about this unbeatably efficient retread service. Or write: Goodyear, Industrial Tire Sales, Akron 16, Ohio.

Use the Right Tire for the Job—Buy and Specify

GOODYEAR

INDUSTRIAL TIRES

GOODYEAR TIRES

Look for this sign; there's a Goodyear dealer near you.

Circle No. 63 on Reader Service Card for more information

Baker 2000-pound gas truck adds warehouse capacity

• Because of its clean, compact design and outstanding maneuverability, this new Baker 2000-pound gas truck gives you more capacity in warehouse and in-plant storage. With minimum "overhang" and short wheelbase – only 102 inches – it has a turning radius of only 61½ inches, operates in 57-inch intersecting aisles. Angle stacking as shown in the photograph can make another cut in aisle requirements. Many operating features mean more work per truck. Absence of cowl and offset drive position give maximum visibility. Lack of obstructions permits operator to mount or dismount quickly from either side. Effortless automotive steer and smooth, self-adjusting hydraulic brakes contribute to safety and easier handling.

Other Baker "Balanced Design" gas fork trucks are available in capacities to 7000 pounds.

Call your nearest Baker representative today, or write direct.

Baker®
industrial trucks

THE BAKER-RAULANG COMPANY
1219 WEST 80th STREET • CLEVELAND 2, OHIO
A Subsidiary of Otis Elevator Company

Otis
TG4

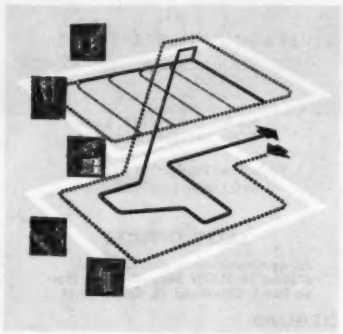
Circle No. 18 on Reader Service Card for more information

MAY 1957
VOL. 12, NO. 8

FLOW

DEPARTMENTS

Advertisers' Index 196
Association and Society News 12
Calendar of Events 16
Catalogs and Bulletins 34
Classified Advertising 195
New Equipment Section 171
Highlights of Month's News 28
Letters to the Editors 8
Men in the News 52
News from the Chapters 24
News from the Sales Field 20
News, Views & Trends 46
New Useful Literature 135



THE COVER

Mechanized material handling has done much to produce a vigorous revival in the once-lagging textile industry. No doubt, some of these same methods may be applied to advantage in your own operations.

FLOW is published monthly by The Industrial Publishing Corporation, 812 Huron Road, Cleveland 15, Ohio, which also publishes:

FLOW DIRECTORY
FLOW'S MATERIAL HANDLING ILLUSTRATED
PRECISION METAL MOLDING
APPLIED HYDRAULICS
INDUSTRY AND WELDING
WELDING ILLUSTRATED
OCCUPATIONAL HAZARDS
COMMERCIAL REFRIGERATION AND AIR CONDITIONING
MODERN OFFICE PROCEDURES
AERONAUTICAL PURCHASING

FEATURES

Modernized Handling . . . Tonic for a Lagging Industry 63

Heavy-Duty Handling Over Crowded Work Areas 64

In-and-Out Flow of Hard-to-Handle Shapes 68

Uninterrupted Movement through High-Volume Production 73

Linear Programming Can Cut Deadheading 78

Custom Deliveries at Off-the-Shelf Speeds 82

Moving a Mountain 87

PACKAGING AND SHIPPING SECTION

Unitization of Irregular Shapes 103

Packaging and Shipping Idea of the Month 106

Simultaneous Baling and Packaging 110

Why Trailer-Carrying Vessels? 116

Pre-Planned Module Decking Increases Capacity 50% 120

SUBSCRIPTION RATES

United States and possessions—$5.00 per year, $8.00 for 2 years. Subscriptions in the United Kingdom: £3.0.0 per annum, payable in Sterling to our London Office.

Foreign—$7.00 per year.

Canada—$6.00 per year.

Single copies—1-10—$.50 each, 11-25—.40 each. Over 25—.35 each. Canada—.50 each. Foreign—.60 each.

BPA

FLOW is indexed regularly by Engineering Index, Inc. "Accepted as Controlled Circulation Publication at Pontiac, Illinois." Please return 3579 forms to 812 Huron Road, Cleveland 15, Ohio.

Copyright 1957 by The Industrial Publishing Corporation

Stacking Problem? call EMI

anything can be "well stacked" or shipped on EMI racks

Big or little, strong or fragile, *anything* stacks or ships better on EMI quality racks. They protect stock, cut handling costs and speed inventory.

EMI RACKS are made of strong, tubular steel and are adjustable to fit any space or unit load. Special racks designed to your specifications with field engineering service on any installation.

Write for our illustrated catalog before you plan additional storage space or the purchase of stacking or shipping equipment.

Well Stacked Racks for Industry

EQUIPMENT MFG. INC.

21550 HOOVER ROAD DETROIT 5, MICHIGAN

Circle No. 53 on Reader Service Card for more information

FLOW

Published by
The Industrial Publishing Corporation
812 Huron Rd.
Cleveland 15, Ohio

President and Publisher
IRVING B. HEXTER

Executive Vice President
LESTER P. AURBACH

Vice President
EDWIN M. JOSEPH

STAFF

Editor
EDWARD H. LEIGHTEN

Managing Editor
STANLEY S. GREENE

Packaging & Shipping Editor
JOHN D. VELARDO

Associate Editors
ALBERT M. JOSEPH
EVERETT L. SPARKS

Production Manager
JAMES M. PUMMER

Art Director
ALARIC MAUSSER

Circulation Director
N. G. KISER

Western Editor
SCHOLER BANGS

FRANCHISE DEPARTMENT

ALAN KICHLER, MGR.
HAROLD F. BEHM
FREDERICK M. MASON, North Central
HAROLD ROBERTS, Eastern
ROSS TAYLOR, Midwestern

Franchise Production Mgr.
WILLIAM L. JERSE

SALES OFFICES

All communications should be addressed to FLOW Magazine, 812 Huron Road, Cleveland 15, Ohio

CLEVELAND
DAVID E. SAWYER
812 Huron Road, Cleveland 15, Ohio.
Phone SUperior 1-9622

NEW YORK
LEE HAAS, DISTRICT MGR.
HAMILTON FINNEY
LAWRENCE L. GRAVES
V. STEIN, Administrative Ass't.
Room 836, 60 E. 42nd St., New York 17, N. Y. Phone MUrray Hill 7-3420

CHICAGO
CHARLES F. GEYER, DISTRICT MGR.
S. R. TRACY
E. H. ST. JULES
Suite 704, 520 N. Michigan Ave., Chicago 11, Ill. Phone WHitehall 3-1655

LOS ANGELES
ALAN CAZIER
Room B, Granada Bldg., 672 S. LaFayette Park Place, Los Angeles 57, Calif. Phone Dunkirk 7-5104

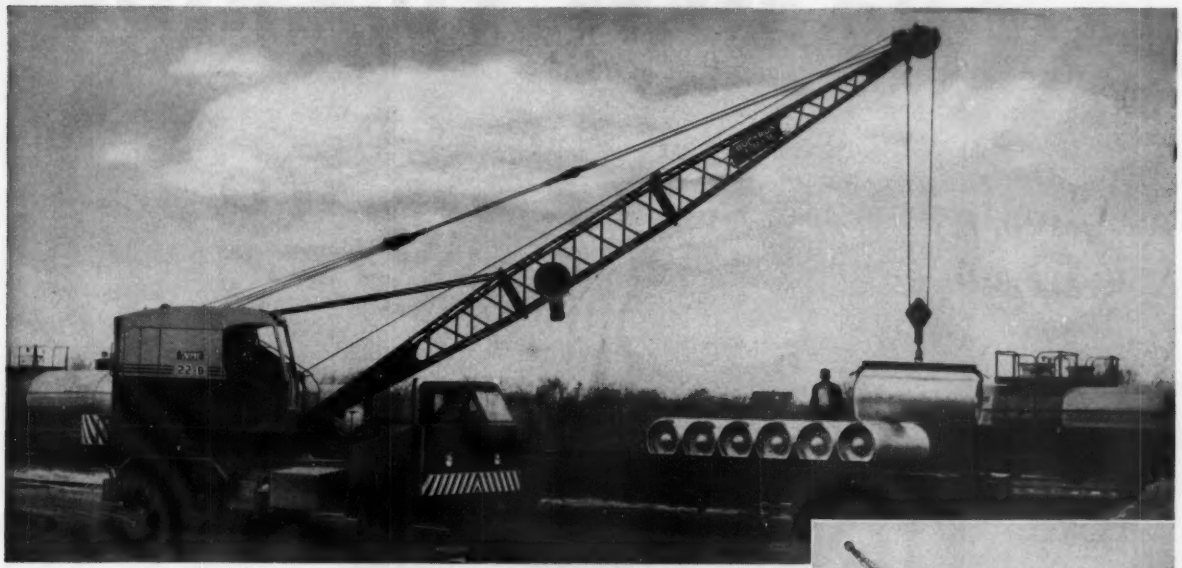
SOUTHERN OFFICE
HAROLD F. BEHM, MGR.
550 Pennsylvania, Melrose Park
Ft. Lauderdale, Florida.
Phone LUdlow 3-3659

LONDON
JOHN A. LANKESTER
31 Palace St., Westminster, London S. W. I. England. Phone Victoria 2608

EUROPEAN REPRESENTATIVE
ERICH BOPP
22b Ingelheim (Rhein), Western Germany

One of these 22-B Cranes Answers YOUR Handling Needs

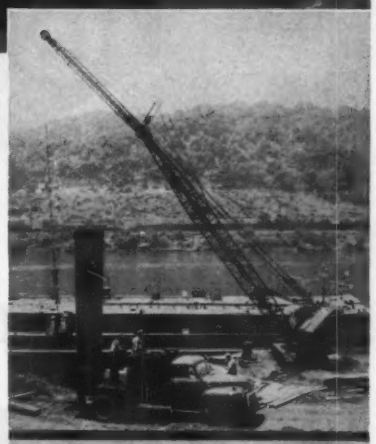
Whether you are handling materials in widely scattered locations, over difficult terrain, or in close quarters, there is a Bucyrus-Erie 22-B crane which will do an outstanding job of handling your particular situation. Each has the power, long reach, and solid construction that help you save money through efficient, long-term service. 253E56



22-B TRANSIT CRANE

Reach and Mobility

Combining heavy-duty lifting crane features with rubber-tired mobility, the 22-B Transit Crane handles booms from 30 feet (standard) to 80 feet (with removable inserts), has lifting capacity of 25 tons. Job-to-job moves are fast and convenient.



Heavy Work

HEAVY-DUTY 22-B CRANE

An outstanding performer wherever extra strength and stability are vital, the Heavy-Duty 22-B has high maneuverability on rough or soft terrain. It is equipped with a 35-ft. boom, extendible to 70 feet through use of inserts. Long, flat crawlers with 30-in. treads, friction swing brake, power controlled lowering for the main hoist line, and telescopic pipe boom stops are only a few of its many features.

General Service

22-B CRANE

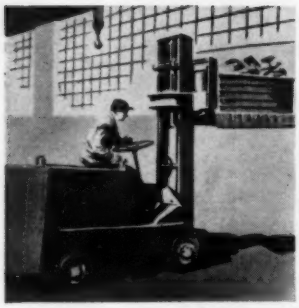
For a variety of jobs requiring highly dependable service, the standard 22-B crane can't be topped. Carrying a 35-ft. boom extendible to 70 feet, this machine has high maneuverability and great stability as well as independent power boom hoist and many other features you ordinarily find as optional equipment on other cranes.

For complete information on any one or all of these models, see your local Bucyrus-Erie distributor or write direct.

BUCYRUS-ERIE COMPANY

South Milwaukee, Wisconsin

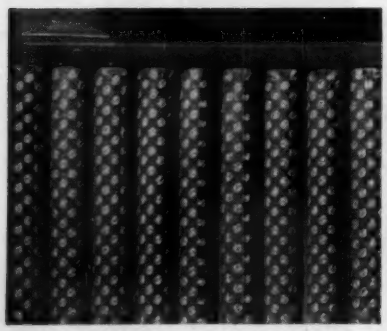
Circle No. 27 on Reader Service Card for more information



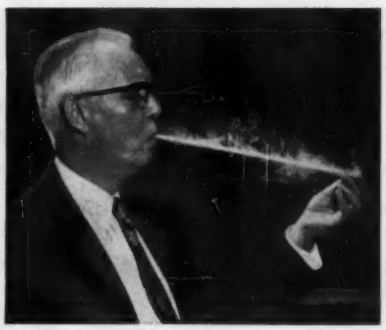
Get more work from your

NEW TG EXIDE-

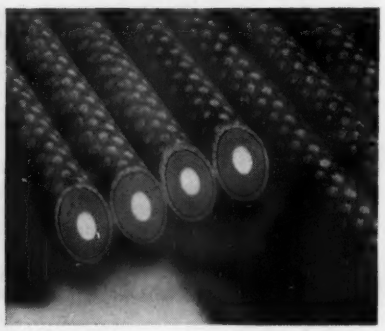
NEW POSITIVE AND NEGATIVE PLATES – DEVELOPED



New tubular construction of positive plate! Armored porous tubing. Provides resistance to corrosion and effects of vibration, improved flexibility, and maximum retention of active material. Thousands of tiny openings mean...



Greater porosity. Highly permeable tubes ease current flow, reduce internal resistance, improve access of electrolyte. Battery will deliver more power to meet sudden heavy loads. Tubes hold...



More active material. Chief source of battery power. Larger inside diameter of tubes means every positive plate contains more active material per cubic inch of plate. And for maximum capacity and long life, there's a...

electric industrial trucks

IRONCLAD BATTERY

Want more work hours—no increase in battery size? You get 44% more capacity in the new TG Exide-Ironclad Battery. For example, you can replace a 500 ah battery with a 720—in the same size. This means your trucks can do more work. They can earn a great deal more on your investment in them.

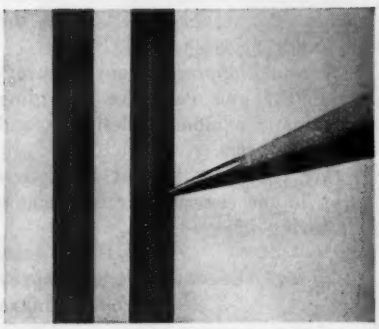
Satisfied with the work capacity of your present battery? Then get it at the lowest cost to own and operate—and get the newest, most advanced electric industrial truck on the market today.

Packs 44% more power into same battery space . . . priced to give you even greater battery economy

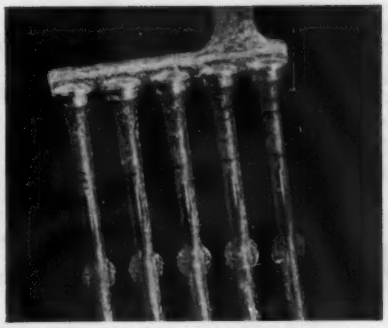
Want even lower operating cost and improved performance from your electric industrial trucks? Here Exide makes it possible. The new TG Exide-Ironclad Battery combines challenging new materials with an ingenious overall new design to produce the highest capacity per cubic inch of any battery available today. It's the most dramatic increase in capacity and the biggest step forward in power per dollar in history. This new battery can benefit every user of electric industrial trucks.

Learn more about the operating and expense advantages. Call your nearby regional Exide representative. Or write for complete information. Exide Industrial Division, The Electric Storage Battery Company, Philadelphia 1, Pa.

OUT OF RESEARCH STARTED 15 YEARS AGO



Thicker negative plate. Specially designed to match the increased capacity of the new positive plates. Plate is both thicker and stronger and possesses better electrical characteristics. You get all these advantages . . .



Plus Silvium,* Exide's exclusive grid alloy—proved more corrosion resistant than other leading grid alloys. Silvium is a patented combination of metals designed to prolong battery life. **U. S. patent*

Exide®

The Electric Storage Battery Company

Circle No. 51 on Reader Service Card for more information

NEW TENNANT MODEL "80" sweeps most main aisles in 2 passes or less.

it's "aisle-designed" to... save more in sweeping costs!

Here's a NEW concept in *low-cost* sweeping—the new "aisle-designed" TENNANT "80" Power Sweeper.

Specially engineered for maximum sweeping capacity (with minimum machine size), it does the work of a 3 to 15-man crew . . . enables one man to sweep most main aisles in a single "round trip" of two passes or less.

Features

- Sweeps 42" path (53" with sidebrush).
- Controls dust! Has largest airflow and dirt filter system available.
- Dumps hydraulically in 10 seconds.
- Built for HEAVY-duty work; has rugged chain-gear drive, husky frame.
- Reverses instantly without shifting gears. Turns in 65" radius.
- Has 5-minute brush change.

Sweeps EXTRA-CLEAN! *Exclusive* brush-vacuum system assures nearest approach to 100% "dust-free" sweeping yet developed. You'll see the difference! High airflow fan sucks dust thru largest filter-area provided on any sweeper.

Picks up dirt, debris on-the-run. Exclusive floating-action hopper allows 42" main brush to pick up both bulky debris and fine dirt *in one operation.* No dribbling . . . no slow-up for adjustments!

Is EASY TO OPERATE; you can learn to run it in 5 minutes. Drives like a car! Operator can start, stop, and reverse sweeper instantly without removing his hands from the wheel. Has 10-second power dumping . . . is highly maneuverable, built for heavy-duty use. *Write for details.*

G. H. TENNANT COMPANY, 707 N. Lilac Drive, Minneapolis 22, Minn.

TENNANT POWER SWEEPERS

SPECIALIZED MAINTENANCE EQUIPMENT

POWER SWEEPERS • FLOOR MACHINES • SCARIFIERS • ROOF SCRAPERS • CONCRETE ROUTERS

Circle 152 on Reader Service Card for more information

LETTERS TO THE EDITORS

Bouquets

To FLOW:

The March issue featuring the article "Conveying by Air" was of special interest to us because we are considering such a system.

We receive a number of dusty materials in bags and have always found the dumping of them without creating a great deal of dust a problem. We note on page 74 a picture of a portable hopper for slitting bags without spreading dust. We would appreciate it if you could advise us where we could get additional information on the construction of this hopper, particularly the method of slitting bags.

R. G. Frederick
Johns-Manville
Zelienople, Pennsylvania

To FLOW:

Just a note to tell you how much we enjoyed the articles on pneumatic handling in your March issue. Please accept our compliments for the very readable and thorough article.

W. M. Dalton
The Dalton Foundries, Inc.
Warsaw, Indiana

To FLOW:

Congratulations on your very fine article "Conveying by Air" in the March 1957 issue of FLOW.

I would appreciate any information that you can give regarding pneumatic equipment designers and manufacturers.

My particular interest is application in the cemented carbide manufacturing field.

J. H. Brownlee
General Electric Company
Detroit, Michigan

To FLOW:

In the March, 1957 issue of FLOW there was an article on page 73 en-

Good Warehousekeeping the *American* way

has proven the most economical and efficient handling of live storage

KNOW where every item in your stock is located, and have **every item easily and quickly accessible.** Protect stocks against damage. Speed and simplify inventory taking. American Racks are quality built — built to withstand rough, tough usage year in and year out, in any industry. You can't beat the "American" way for top efficiency and economy. Make us prove this fact. Distributors from coast to coast. Immediate service. Write us today.

ERECTED WITHOUT BOLTING OR WELDING

AN EXCLUSIVE AMERICAN FEATURE

AMERICAN METAL PRODUCTS COMPANY

STORAGE RACK DIVISION

DETROIT 4 amp MICHIGAN

There's an AMERICAN STORAGE RACK for every storage need

Standard Pallet Racks | Adjustable Pallet Racks | Tool & Die Racks | Tiering Racks | Skid Racks | Drum & Barrel Racks | Coil Racks

amp Plants and Subsidiaries: (American Metal Products Co.—Detroit, Mich.—Union City, Tenn.) (AllianceWare, Inc.—Alliance, Ohio—Kilgore, Texas—Colton, Calif.) (Borroughs Manufacturing Co.—Kalamazoo, Mich.) (General Spring Products, Ltd.—Kitchener, Ont., Canada) (Tube Reducing Corp.—Wallington, N. J.)

Manufacturers of quality products for automobiles, trucks, aircraft, offices, factories, warehouses, and homes.

Circle No. 7 on Reader Service Card for more information

protect against overload danger with

ANCHOR-WALDRON

Automatic CUT-OUTS

For conveyor drives of all types, these Anchor-Waldron Cut-Out units quickly pay for themselves in many ways. By insuring continuous operation of conveyors without loss of time caused by sheared drive pins; by automatically stopping conveyor before overload occurs; by eliminating undue shocks to the system—machinery is protected, production increased, time and labor costs reduced.

Anchor-Waldron Cut-Outs are available for either belt or direct connected drives.

For complete details—sizes, working range, etc., write for Catalog 51.

JOHN WALDRON CORP. • NEW BRUNSWICK, N. J.

Sales representative in Principal Cities

Export Agents • Frazar & Company, Inc.

STANDARD TYPES — Waldron COUPLINGS — SPECIAL TYPES

Circle No. 164 on Reader Service Card for more information

LETTERS

Continued

titled "Conveying by Air". On page 78 there was a list of typical materials being handled by pneumatic conveyors. There are five commodities—ammonium sulphate, coal pulverized, dolomite, flue dust and fluospar.

If possible could you supply me with the names of the companies that may have a pneumatic bulk handling installation that would handle any one or any number of these commodities.

James J. Minder
Ford Motor Company
Dearborn, Michigan

We are seldom given to waving our own banner, but the influx of letters such as those above has left us walking on clouds. The information requested by these and many other readers has been provided, and the manufacturers informed of their interest.

Caster Data Needed

To FLOW:

Would you please advise us if you have any reprints available concerning the use and selection of casters. A list of any other reprints which might be of some help in the selection of material handling equipment would be appreciated.

C. R. Stocker
Ameroton Corporation
Aberdeen, North Carolina

Two recent FLOW articles deal with the subject of casters. Reprints of both have been sent.

From Overseas

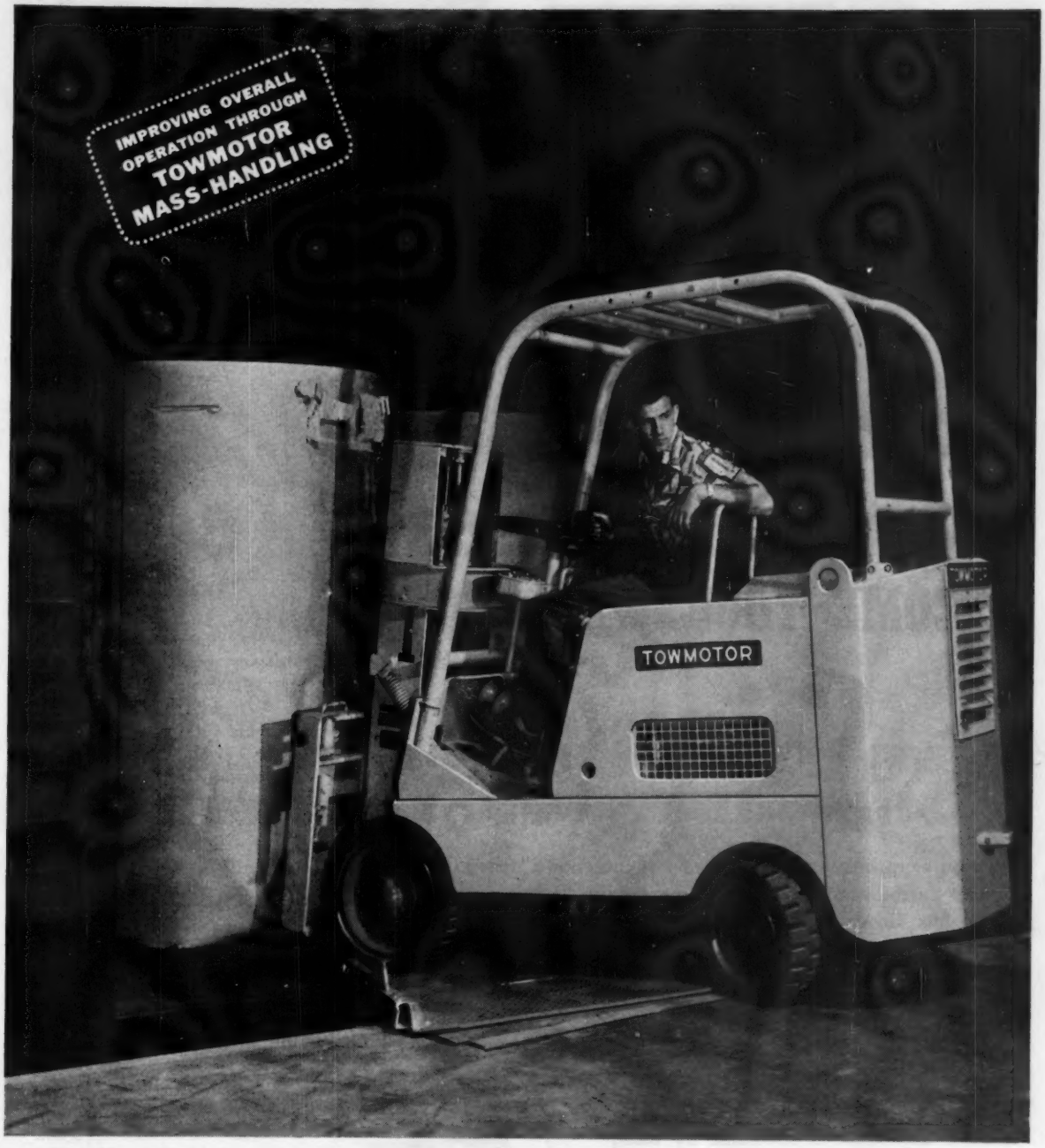
To FLOW:

As dealers in Belgium and the Grand Duchy of Luxemberg for fork lift trucks, we would be interested in getting some information about the firms that are making palletizing machines in the States.

Would you be good enough to give us the address of these firms.

J. Collard
Materiels & Materiaux de
Construction En Belgique S. A.
Brussels, Belgium

We would, and did.



...increasing productivity without adding personnel!

Management men in every industry are giving productivity and profits—*as well as personnel*—a lift by integrating Towmotor mass-handling in all operations from receiving to delivery.

Every department benefits. More work gets done. And you don't need more men to do it because Towmotor fork lift truck operators are finding it's *fun* to multiply the handling of materials aided by 12 new Towmotor improvements like these:

- New functional body styling
- New pace-setting comfort features
- New "tight-spot" maneuverability
- New centralized easy-reach controls
- New positive-response hydraulic lift
- Towmotor-improved power steering

Some of the industry's most significant advances in fork lift truck design and performance are shown in Towmotor's latest bulletin #SP-23. See how they help supplement your personnel—permit your men to do a bigger day's work easier—give each operator the power to improve your plant's productivity and profits.

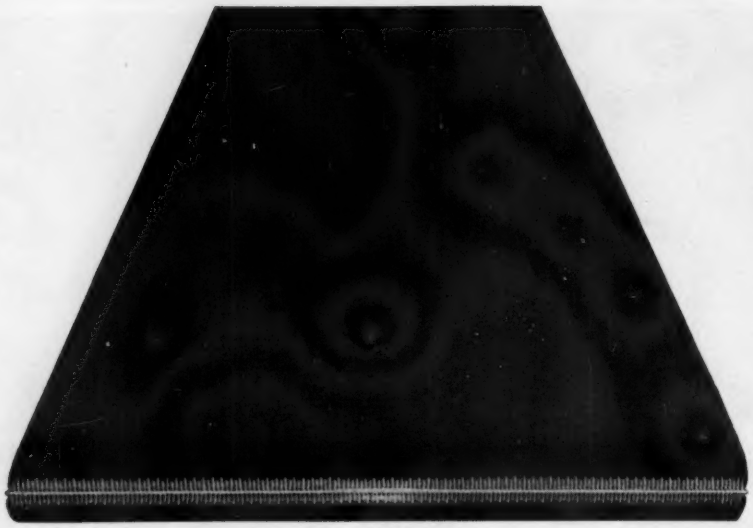
Write Towmotor Corporation, Cleveland 10, Ohio. We'll send the illustrated booklet immediately.

Leaders for 38 years in building Fork Lift Trucks and Tractors

TOWMOTOR ® THE ONE-MAN GANG **-GERLINGER**

Gerlinger Carrier Company, Dallas, Oregon is a subsidiary of Towmotor Corporation, Cleveland, Ohio

Circle No. 157 on Reader Service Card for more information

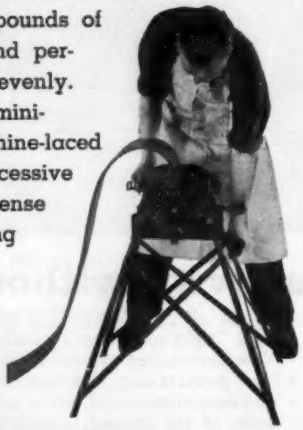


MAINTENANCE SAVINGS COME YOUR WAY with

Clipper

HOOKS and LACERS

Even on small-diameter rollers like the one shown above, Clipper machine-laced joints are smooth and flexible and give longer life. Hooks are firmly imbedded flush with the belt surfaces and clinched by up to 45,000 pounds of pressure. Double-staggered gripping and perfectly rounded loops distribute strain evenly. Wear on hooks, belts and machinery is minimized by smoothness of the Clipper machine-laced joint. There is no pounding to cause excessive wear. Save maintenance time and expense and cut unproductive downtime by using Clipper hooks and lacers.



FOR MORE INFORMATION

Detailed product information and case history examples of Clipper machine-lacing benefits are contained in Bulletin No. 157. Send for your free copy today.

Ask your Industrial Distributor for Clipper Products

Clipper BELT LACER COMPANY

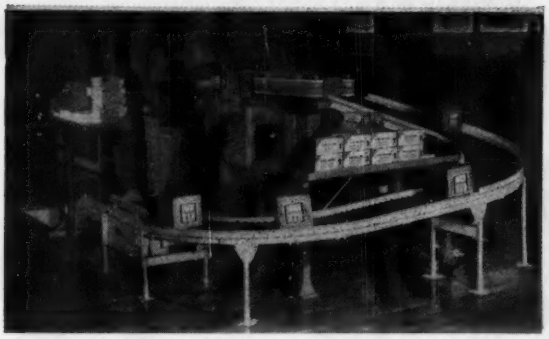
990 Front Ave., N.W. Grand Rapids 2, Michigan

Circle No. 37 on Reader Service Card for more information

ASSOCIATION and SOCIETY NEWS

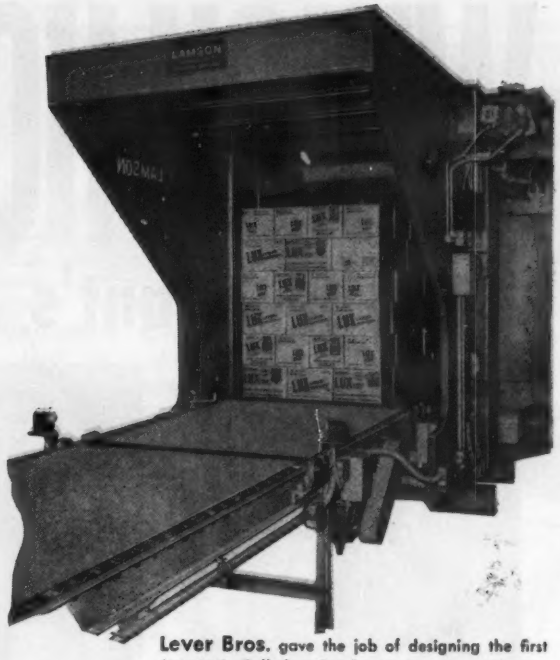
• **Four more material handling equipment manufacturers** have joined the Material Handling Institute, Inc. They are: American Chain & Cable Company, Inc; Economy Engineering Company; Little Giant Products, Inc.; and the Whiting Corporation. The MHI product sections in which they will be active are: electric hoists, powerized hand lift trucks, pallets and auxiliary equipment and monorails repectively, Their official representatives to the Institute are: S. J. Woodworth, sales manager, Wright Hoist Division of American Chain & Cable Co., Inc.; E. W. McDonnell, sales manager and chairman of the board, Economy Engineering Company; H. G. Sharp, president, Little Giant Products, Inc.; and G. E. Seavoy, vice president, Whiting Corporation. MHI membership now totals 80.

• **Chairman of the 1957 National Championship Packaging and Material Handling Competition** will be N. F. Behme, Jr., according to John W. McReynolds, president of the Society of Industrial Packaging and Material Handling Engineers. Behme is chairman of the National Classification Board, American Trucking Associations, Inc. The Championship Competition will be held in conjunction with the National Industrial Packaging and Handling Exposition of 1957, scheduled for Atlantic City's Convention Hall, October 28 through 31. Entries in the competition will be located in the center of the exhibit area.



National Biscuit Company's giant new bakery in Chicago is completely equipped with Lamson engineered conveyors.

Robertson Heating Supply Co., Alliance, Ohio, uses a Lamson Overhead Tow System to speed its order filling.



Lever Bros. gave the job of designing the first Automatic Palletless Loader to Lamson engineers.

do you move products like Coolies built the great wall... by hand?

Systematic work on the Great Wall of China began in 228 B.C., and was finally completed in 1644 A.D. Reaching a length of about 1400 miles, it is a testament to the back-breaking work of literally hundreds of thousands of Chinese. Today, you can't afford to move your products "Coolie-style."

In the package conveyor field, Lamson offers the broadest line. Nationally known companies depend on Lamson to engineer and install belt, gravity and live roll conveyors; continuous trolley systems; reciprocating vertical conveyors of all types; continuous combing verticals; and a broad line of automatic and semi-automatic pallet loaders.

Why not talk over your conveying problems with a Lamson engineer? He'll show you ways to cut costs and meet production schedules.

FOR FURTHER INFORMATION, CLIP TO YOUR LETTERHEAD

LAMSON

LAMSON CORPORATION

225 Lamson Street, Syracuse 1, New York

Plants in Syracuse and San Francisco
Offices in Principal Cities

☐ Have an engineer call me for an appointment.

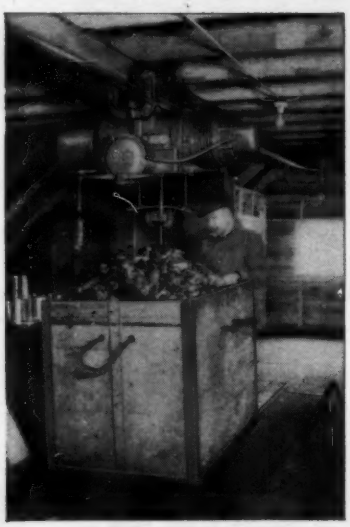
Send me these bulletins:

☐ "Conveyor Facts"
☐ 28-page Roller Gravity Bulletin
☐ "Utilize the Air Rights"
☐ "Automatic Pallet Loader"

225

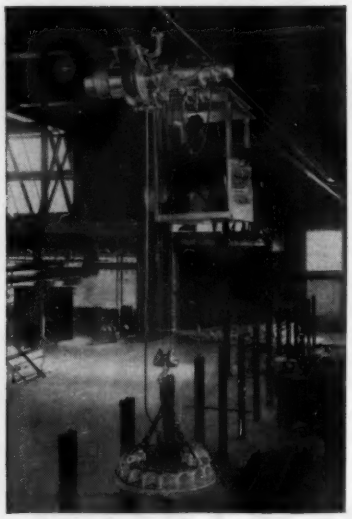
Circle No. 86 on Reader Service Card for more information

WHICH HOIST fits your plant's needs?



SHEPARD NILES
FLOOR-OPERATED HOIST

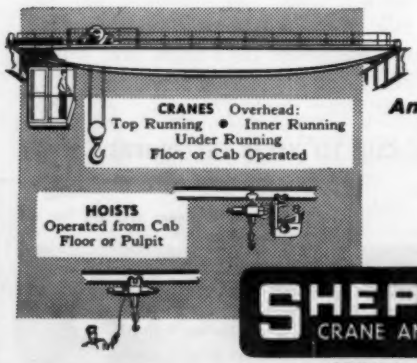
Operator primarily occupied with other duties. Uses hoist for fast, efficient handling of relatively short hauls.



SHEPARD NILES
CAB-OPERATED HOIST

Operator in cab moves loads along at high speeds, occupies best vantage point for spotting and stacking material.

THE RIGHT HOIST . . . can reduce your plant's handling costs. But which one is best for the job . . . a floor-operated hoist where the operator is freed for other duties or a cab-operated hoist where he is engaged fulltime moving loads through the air? Because Shepard Niles manufactures both types of hoists . . . as well as a complete line of cranes . . . we can approach your handling problem with an open mind.



● Send for Bulletins describing Shepard Niles Cab and Floor-Operated Hoists. And request our representative to call.

America's Most Complete Line

of Cranes and Hoists

Since 1903

SHEPARD NILES
CRANE AND HOIST CORPORATION

2772 Schuyler Ave., Montour Falls, N.Y.

Circle No. 142 on Reader Service Card for more information

ASSOCIATIONS

Continued

● **Two new member companies** have joined the Fibre Box Association. Specialty Papers Company, Dallas, Texas, and Crown Corrugated Containers, Inc., Greensburg, Pennsylvania are the latest additions to the group, which represents manufacturers of corrugated and solid fibre boxes.

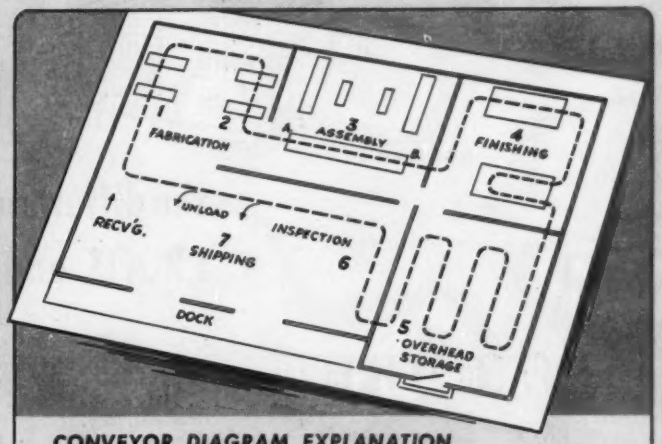
● **The National Wooden Box Association** met recently with representatives of the eastern apple growers industry, in an effort to standardize bin sizes and design for handling apples in bulk. Discussions pointed up the fact that great economies could be effected by the industry if bins were developed to utilize existing facilities including trucks, storage and packing houses, while still offering savings in handling coupled with adequate ventilation and proper protection of the fruit.

● **Members of the Caster and Floor Truck Manufacturers Association** met in Chicago on April 9, 10 and 11. The meeting consisted of a board of directors' meeting, specialized committee meetings, and a regular association meeting. On April 9, the Association met with members of the Material Handling Institute, whose meeting was also taking place in Chicago at that time.

Oh—the big door presents no challenge to you, huh?

CHAINVEYOR

A MONTH AGO YOU COULDN'T HAVE ELBOWED YOUR WAY THROUGH THIS AISLE!
TWICE THE ROOM IN "SHIPPING" TOO, SINCE CHAINVEYOR AUTOMATIZED THE PLANT - AND LOOK AT THAT INSPECTION OPERATION MOVE ALONG!



This complete CHAINVEYOR installation immediately speeded operations in all departments! It conserved valuable floor space, saved man-hours, lowered handling costs and increased production rates. The system moves parts rapidly from assembly through processing, inspection, and storage to shipping — with a minimum of manual handling!

CONVEYOR DIAGRAM EXPLANATION

FABRICATION

1. Machine operator loads conveyor at completion of first process.
2. Chainveyor carries parts overhead to next step, unloads automatically, operator hangs piece on conveyor at convenient dip section.

ASSEMBLY

3a. Traveling quickly up and over the aisle Chainveyor discharges parts at start of assembly table.

3b. At the completion of assembly, the checker loads without moving from the work station.

FINISHING

4. No manual handling in this whole department as parts travel through painting and drying, rotating when necessary, cooling on the conveyor while traveling.

OVERHEAD STORAGE

5. Any amount of "live" storage can be provided, freeing important floor space for other operations.

INSPECTION

6. Parts are continuously checked without laborious lifting or lost motion while on Chainveyor.

SHIPPING

7. Completed assemblies are transported to the final destination, reducing handling cost and increasing efficiency.

Send for your PLANNING FOLDER

by circling your reader service card.

You receive:

- *A handy file folder for keeping materials handling information.*
- *Special illustrated catalog with proven applications, details and representative users.*
- *Explanatory diagram illustrating a typical Chainveyor layout showing component parts.*
- *Plant and conveyor planning grid sheets for preliminary layouts.*

QUALITY OVERHEAD CONVEYOR SYSTEMS

CHAINVEYOR®

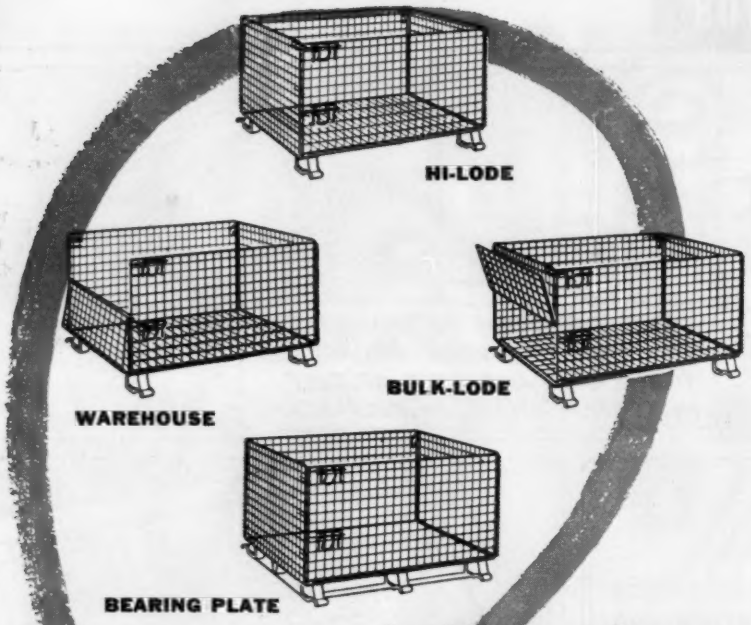
CORPORATION

DISTRIBUTORS IN ALL PRINCIPAL CITIES

DISTRICT SALES OFFICES • NEWARK MILWAUKEE FLINT NEW ORLEANS

MAIN OFFICE • 5618 E. Washington Blvd., Los Angeles, Calif.

Circle No. 33 on Reader Service Card for more information

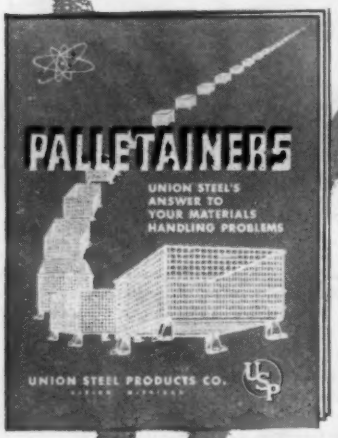


the difference between PROFIT and LOSS . . .

. . . is determined by your efficiency in handling parts and products between successive production stages—shipment and delivery.

And . . . if you're interested in reducing high handling costs in your plant, send for Union Steel Products Company's big, new Palletainer catalog.

It quickly and concisely shows many different Palletainer applications which represent the latest methods of handling, storing and warehousing. Construction features and complete specifications on the broad range of models available are also covered.



Yours for the asking . . . the big, new Palletainer catalog. Profusely illustrated with interesting and varied money-saving Palletainer applications plus complete specifications and construction details.

See for yourself how USP Palletainers will quickly and easily pay for themselves in your plant. Union Steel's Material Handling engineers will be glad to assist you in determining the proper equipment to match the job—without obligation. Why not start today?

IT'S FREE!

USP
UNION STEEL PRODUCTS CO.
Albion, Michigan

Gentlemen: Please send me my copy of the new 1957 Palletainer booklet at once.

Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____

Please have your nearest Palletainer representative contact me_____ ☐

Circle 161 on Reader Service Card for more information

CALENDAR OF EVENTS

June 9-13

American Society of Mechanical Engineers—Semi-Annual Meeting
Sheraton-Palace Hotel
San Francisco, California

June 9-14

Engineering Conference on Automation
Pennsylvania State University
Extension Conference Center
University Park, Pennsylvania

June 11-13

Western Plant Maintenance and Engineering Show
Civic Auditorium
San Francisco, California

September 30-October 4

Canadian National Material Handling Show and Conference
Show Mart
Montreal, P. Q.

October 1-3

Third Joint Military-Industry Packaging and Material Handling Symposium
Fort Lee, Virginia

October 28-31

National Industrial Packaging & Handling Exposition of 1957
Convention Hall
Atlantic City, New Jersey

You ain't going to like the soup, but there's plenty of it!

Circle 34 on Reader Service Card

Circle No. 33 on Reader Service Card for more information

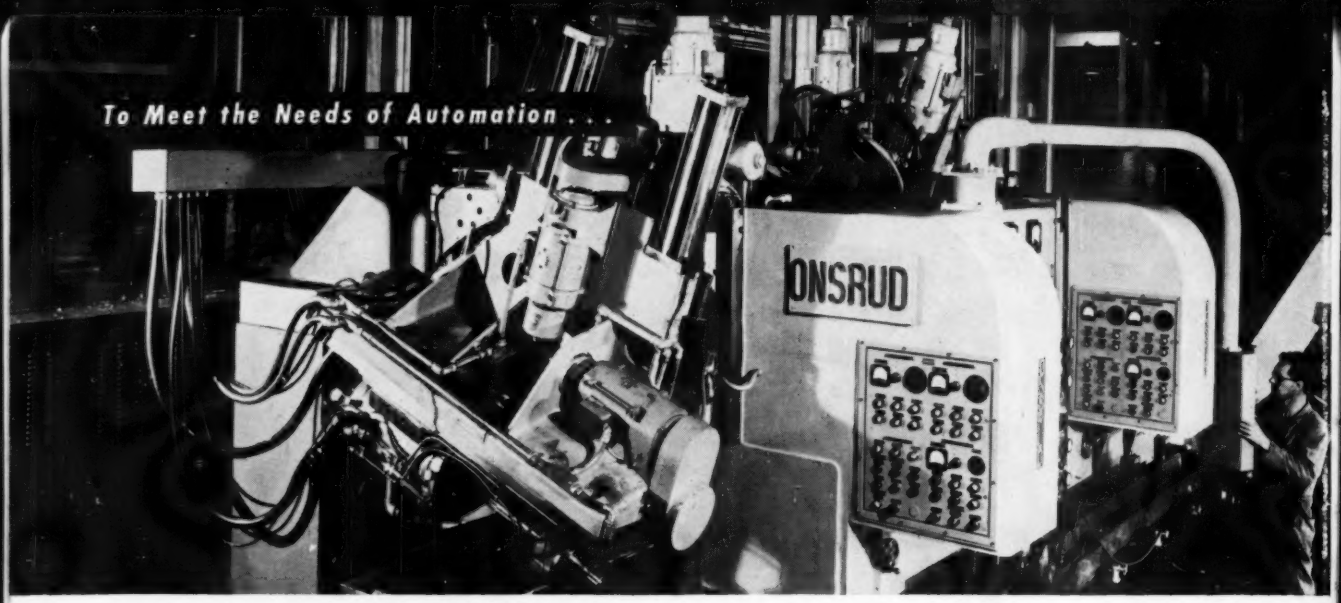
Stop engine! Hood up! Start Savings!

You'll be setting no record with the all-new *Clarklift* if only ten seconds elapse from the time it rolls to a stop and a service man goes to work on the engine. If it's magic, there's only one trick—the whole hood swings back, seat and all, and in *much* less than *ten* seconds, too. All engine components are immediately accessible. Your service man can go right to work. And *reversing* the procedure is as simple as closing your automobile hood.

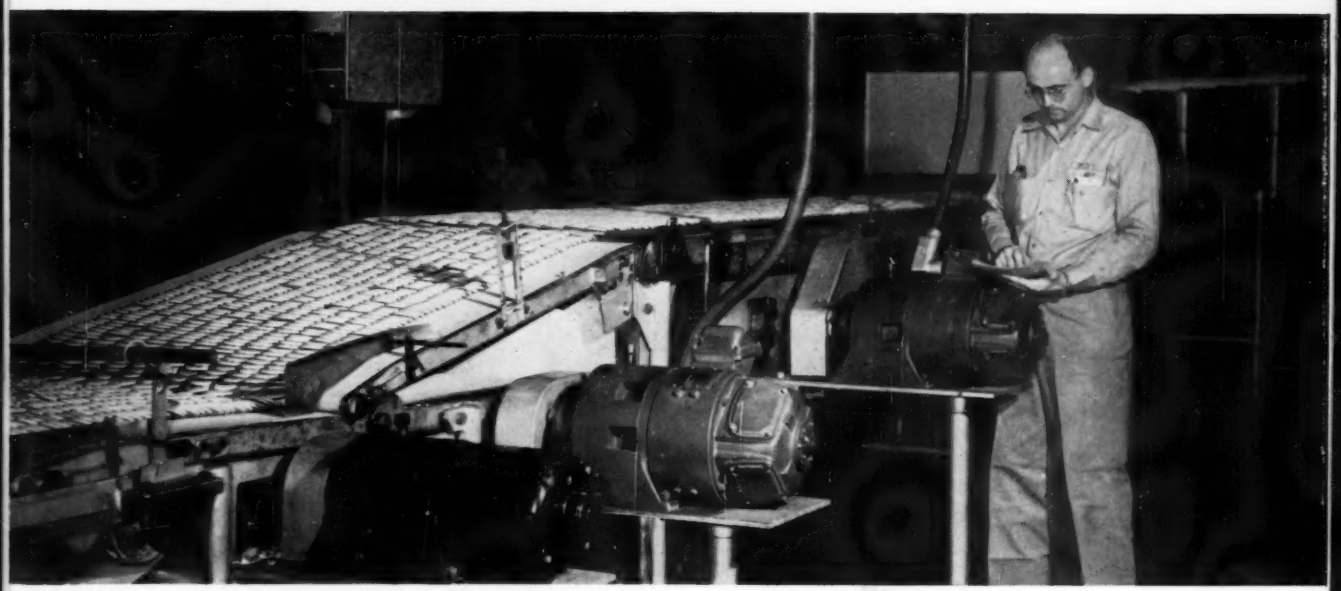
There are no bolts, no screws, no metal plates. All this saves valuable hours every month *usually* wasted *in just getting ready* to service the average truck. You know your service-hour rates better than we do, so you figure the savings. Then let's get together to prove it.

Industrial Truck Division
Clark Equipment Company
Battle Creek, Michigan

CLARK® EQUIPMENT



FROM AUTOMATED MACHINES . . .



TO COOKIE CONVEYORS . . .

General Electric Gear-Motors Prove Low-Cost Dependability in Every Industry

Whether you use cranes or conveyors, machine tools or mixers, *any* of the host of applications employing low-speed drives, G-E gear-motors can save you money.

The more compact construction of the packaged gear-motor design assures speed reduction in a minimum of cubic feet. Units are easy to install, and, because gear-motors are built for specific speed requirements, may be direct-connected, if desired. This means down time can be reduced because inspection and replacement, common with belts, chains and other forms of speed reduction, are not required.

To meet the increasing demand for gear-motors, General Electric has consolidated its gear-motor activities and established a new Gear Motor and Transmission Components Department in Paterson, N.J., devoted solely to the design and manufacture of mechanical power transmissions. For more information, contact your G-E Apparatus Sales Office or nearest gear-motor distributor. *Gear Motor and Transmission Components Department, Paterson, New Jersey.*

851-4

Progress Is Our Most Important Product

GENERAL ELECTRIC

Circle No. 186 on Reader Service Card for more information

What is lift-truck accessibility?

You'll find a whole new definition of lift truck accessibility in these *facts* about the new *Clarklift:* the hood swings back in seconds revealing every part of the engine for routine maintenance; the counterweight hangs on hooks, is held in place by a *single* bolt. The *entire* power train is exposed and upright removed in minutes.

Brakes are self-adjusting. Rollers can be adjusted right on the upright without disassembly. One multiple plug disconnects the *entire* electrical system. Drive axle and brake system units are easily removed. Bearings sealed in wheel hubs eliminates replacement or repacking every time wheel is removed. You can get many more facts by calling your *Clarklift* dealer.

Industrial Truck Division
Clark Equipment Company
Battle Creek 13, Michigan

CLARK® EQUIPMENT

Circle No. 35 on Reader Service Card for more information

set-up is a
SNAP
with BUSCHMAN
"QUICK-EEZ" Coupling!
Slotted top of adjustable stand receives extended plates of conveyor sections, providing rigid coupling and support . . . one of many advantages that makes BUSCHMAN Roller or Wheel type the preferred portable gravity conveyor.

Pick up . . . place . . . in line every time! With both ends the same, BUSCHMAN Portable Conveyor sections always match. No more swinging . . . no more shifting . . . no damaged hooks. "QUICK-EEZ" makes set-up or rearrangement a snap. BUSCHMAN engineering know-how helps you cut time, labor, man hours . . . keeps operational time *profitable*. Complete line in steel or lightweight aluminum. *Other coupling designs available.*

For cost-cutting convenience and flexibility, order BUSCHMAN! Immediate delivery from local dealer's stocks.

Write for bulletin no. 15 today

PRODUCE MORE FOR LESS on Buschman CONVEYORS

C-326-EWB

THE E. W. BUSCHMAN CO.
4450 Clifton Ave.
Cincinnati 32, Ohio

Circle 29 on Reader Service Card for more information

NEWS *from the* SALES FIELD

H. M. Stiles

Harold M. Stiles, sales executive of Yale Materials Handling Division, **The Yale & Towne Manufacturing Co.,** has been named western regional sales manager by **Clyde R. Dean,** general sales manager. In his new position, Stiles is in charge of supervision and promotion of Yale industrial lift trucks and hoists in the 11 most western states and the Canadian provinces of British Columbia and Alberta. He succeeds **Frank Boufford,** who has joined the staff of the Yale sales and service branch in San Francisco.

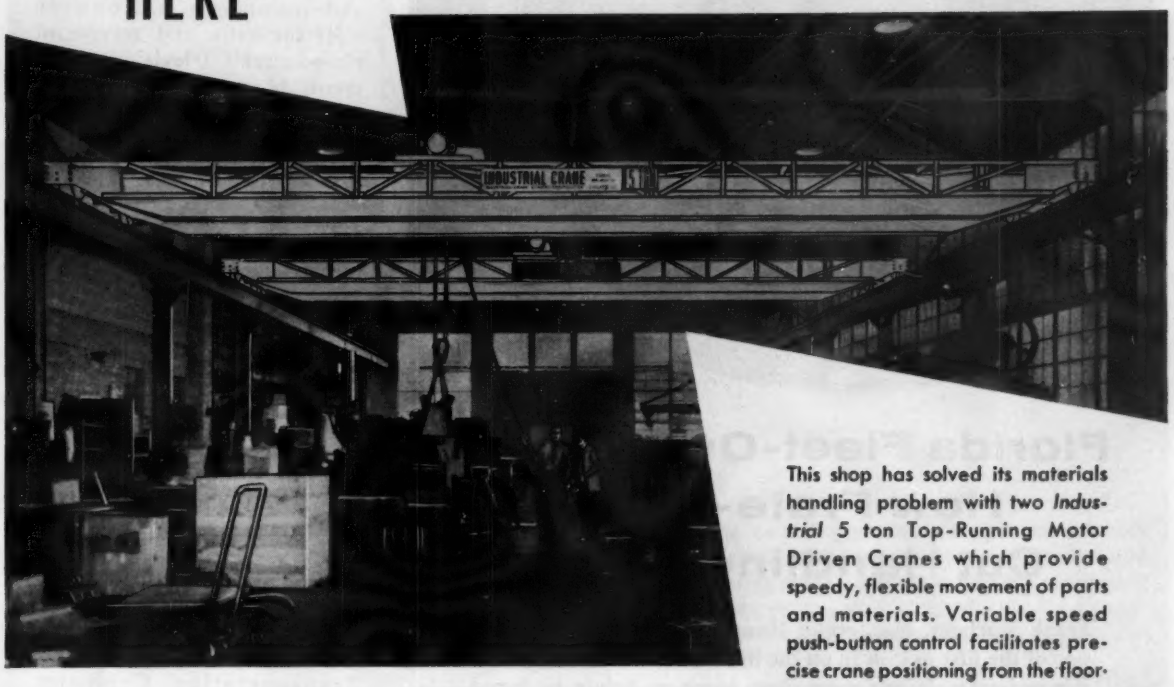
T. R. Lane

Thomas R. Lane has been named supervisor, motive power sales of **Exide Industrial Division of The Electric Storage Battery Company.** He will supervise engineering sales of Exide-Ironclad and Exide-Powerclad batteries and other Exide equipment for electric industrial trucks. Lane was brought to the Philadelphia home office from Syracuse, N. Y., where he had been the company's sales and service representative.

Appointment of **Charles J. Simon** as manager of sales for industrial television in the **General Electric Company's Products Department** has been announced by **Frank P. Barnes,**

NO HANDLING PROBLEMS HERE

with Industrial top-running motor driven cranes



This shop has solved its materials handling problem with two *Industrial* 5 ton Top-Running Motor Driven Cranes which provide speedy, flexible movement of parts and materials. Variable speed push-button control facilitates precise crane positioning from the floor.

Whatever the size of your shop, there's an *Industrial* Crane that will help you solve your materials handling problems. You'll find *Industrial* Cranes are *the best cranes for the long run* because they're quality built to reduce maintenance and operating costs. Here are a few *Industrial* features that make them a better value:

- Rolled Forged Steel, heat treated wheels.*
- Long-life, precision ball and roller bearings.
- All-welded, precision jig-bored end trucks for true, smooth operation.
- Two large size gusset plates at each end-truck assure permanent squareness.
- Rugged outrigger for additional lateral strength and support of bridge drive.
- Special push-button control for efficient operation from floor or cab control.
- All *Industrial* cranes designed for easy erection at job site.

*Standard on Heavy Duty models.

***Industrial* builds a complete line of cranes for every need.**
Consult with *Industrial* for assistance in solving your materials handling problems.

Industrial CRANES

TRMDF-257C

INDUSTRIAL CRANE & HOIST

INGERSOLL PRODUCTS DIV. BORG-WARNER CORP.

1530 S. PAULINA STREET, CHICAGO 8, ILLINOIS

Export Sales: Borg-Warner International, 36 South Wabash Ave., Chicago 3, Illinois

Circle 76 on Reader Service Card for more information

Florida Fleet-Owner Tells How Frate-Gates Cut Handling Costs!

Frank Teachout, Manager of Hunt Truck Lines, Tampa, was one of the first to cash in on the big savings offered by elevating end-gates. It was some time, however, before he found what he considers the best gate for his fleet. "We tried every major make," says Teachout, "but the new Gar Wood Frate-Gates are superior to anything we've ever seen. Their speed and all-around efficiency has reduced handling costs *well below* what we get with any other make!"

"For one thing," continues Teachout, "the three-point platform suspension handles off-center loads better. That in itself saves my drivers valuable time. Just as important, the cycle is fully-powered in every phase. Because cargo can't drop too quickly, our breakage problem during loading and unloading has been eliminated. My drivers particularly appreciate the features that make for safer operation. Unlike some units we've tried, Frate-Gates have dual controls . . . can be operated from either side of the truck, away from traffic!"

Frate-Gates can cut your *handling costs!* Arrange to see one in operation by calling your Gar Wood-St. Paul truck equipment distributor. Or, write to: Customer Service Dept., Gar Wood Industries, Inc., Wayne, Michigan.

GAR WOOD INDUSTRIES, INC.
Wayne, Michigan • Richmond, Calif.

Gar Wood -St. Paul-

Circle No. 60 on Reader Service Card for more information

manager of marketing for ITV. Simon formerly held a similar position for the Department's line of radio and television broadcasting equipment. In his new position, he will organize and maintain a nationwide staff for sales and service of closed-circuit television equipment, both color and black-and-white.

The Towmotor Corporation has leased a new sales and maintenance headquarters in Port Newark, New Jersey, for the handling of its lift truck and cargo handling equipment. The building, scheduled for completion about the first of the year, will be a one-story structure, 148 feet long and 100 feet wide. It will accommodate office, storage, repair and display areas, and will be serviced by a 16,300 square foot paved open area.

Appointment of **K. K. Stonebraker** as sales manager of its Transporter line has been announced by the **Automatic Transportation Company.** Stonebraker succeeds **J. M. Johnson,** who has been named

K. Stonebraker

J. M. Johnson

to the newly created position of national factory representative. As sales manager—Transportar, Stonebraker's responsibility includes direct supervision of sales and promotion of the line which includes pedestrian-led trucks and special narrow aisle walkie types of Transtackers. Johnson, in his new post, will coordinate activity relating to national accounts.

from abrasive slurries to delicate foods . . .

MOYNO® PUMPS

CUT HANDLING COSTS

The Moyno "progressing cavity" pumping principle has enabled thousands of plants to pipe difficult materials that were transported by hand and other expensive means. Moyno is the only pump that can handle many abrasives, pastes, slurries, chemicals, foods, suspended solids, etc., without foaming, aerating, crushing or excessive pump wear.

As shown above, Moyno Pumps have a screw-like rotor that revolves in a double threaded stator creating progressing cavities which smoothly move material through the pump. They will pump anything that will move through a pipe . . . even plaster and non-pourable pastes!

Moyno Pumps are available in capacities up to 500 gpm and pressures up to 1000 psi.

Examine your processing methods. No doubt there are several places where Moyno Pumps can drastically cut costs. Ask us, we'll give you a frank answer. Send us an outline of your problem today! Write for Bulletin 30-FL

R&M

ROBBINS & MYERS, INC.

SPRINGFIELD, OHIO — BRANTFORD, ONTARIO

Circle No. 134 on Reader Service Card for more information

CUT YOUR OVERHEAD

in materials-handling problems with

AE ELECTRIC CUSTOMIZED

LO-HED HOISTS

- Cuts overhead space requirements
- Five classes lift ¼ to 12 tons
- Five suspensions available
- Four types of controls
- Shrouded bottom block
- Two automatic brakes
- Anti-friction bearings throughout
- One-hand operation
- Full load tested

Write for literature describing the Customized Lo-Hed Hoist or the pace-setting AE Standard Lo-Hed, available in 2- and 3-ton capacities —the latest word in modern hoist engineering and materials.

AMERICAN ENGINEERING COMPANY

DEPT. H-162, WHEATSHEAF LANE & SEPVIVA ST., PHILADELPHIA 37, PA.

Canadian Subsidiaries: Affiliated Engineering Corporations, Ltd., Montreal, P. Q. . . . Bawden Industries Ltd., Toronto, Ont.

AE Products are: Taylor, Perfect Spread and Vibra-Grate Stokers, Hele-Shaw and Hydromite Fluid Power, Lo-Hed Hoists, Lo-Hed Car Pullers, Marine Deck Auxiliaries.

Circle No. 6 on Reader Service Card for more information

MHS NEWS FROM THE CHAPTERS

PHILADELPHIA, PA.—Members of the Philadelphia Regional Division of SIPMHE recently heard **Thomas P. Wharton,** vice president and manager of Container Laboratories, Inc., talk on the subject, "The Fundamentals of Cushioning Materials". Wharton illustrated with graphs and diagrams various methods for determining the proper amount and kind of cushioning to use.

ROCHESTER, N. Y.—"Justification of a Material Handling Problem" was the subject of the April meeting of the Rochester Chapter of AMHS. Guest speaker was **Earl Gruendike,** works manager of General Railway Signal Company. On May 15, the group has arranged to conduct a plant tour of the Rochester Products Division of General Motors Corporation.

MINNEAPOLIS, MINN.—A panel discussion on package testing was featured at the April meeting of the Minnesota Division of SIPMHE. Types of tests, equipment available and similar topics were discussed by the group. Speakers included **Harry Collins,** Northwest Corrugated Box Co.; **Donald Landsvork,** Minnesota Mining & Manufacturing Co.; and **Peter Henningsen,** Minneapolis Honeywell Regulator Co.

CHICAGO, ILL.—The Illinois Division of SIPMHE will hold a one-day Packaging and Material Handling Seminar at the Congress Hotel in Chicago, on May 24. Four panel groups covering topics of current interest in material handling will be held, as well as four panels covering topics in packaging. Panel groups will be sched-

A-W Hydraulic Crane handling 40-ft. angles with ease in the storage yard.

AUSTIN-WESTERN HYDRAULIC CRANE

solves material handling problem in storage yard of I-T-E Circuit Breaker Company, Greensburg, Pa.

Versatile machine costs only half the operator's wage

In 1954 the handling of heavy and bulky materials became a problem for the stores and yard operation at the R&IE Equipment Division (Greensburg, Pa.) of I-T-E Circuit Breaker Co. An expansion of the plant prevented switch track installation and limited highway access to the 7-acre storage yard. Steel beams and long aluminum extrusions could be unloaded from the freight car sidings at the west end of the steel fabricating shop, but the overhead crane load of such material as 65-ft. beams had to be broken down by hand and transported by an inadequate 1-ton lift truck as far as 300 feet to its assigned place in the storage yard.

Here is what the user has to say about it: "We installed a 5-ton capacity Austin-Western Hydraulic Crane, which soon proved itself on this and many other operations. The boom is extensible to 24 ft. and at the same time can be revolved through a full 360° circle under precise hydraulic control. The boom can be extended and retracted at the same time it swings or the crane moves forward or back. Large tires and 4-wheel power steering give the A-W remarkable maneuverability that speeds the accurate placing of the material in the yard."

Fast worker. "We can carry four or five times as much material, make a faster round trip to the yard, and save most of the manual breakdown formerly required in the bay. The transfer of material from the west end of the steel fabricating bay to the storage yard, a job that now takes the A-W unit only a quarter of an hour to accomplish, formerly required one and one-quarter hours."

Indispensable tool. "The yard foreman reports that since his men have learned how to use the speed, maneuverability and accuracy of this hydraulic unit, they could not get along without it."

Low cost operation. "The total machine cost equals less than $2500 a year, or $8.26 a day—almost exactly half the operator's wages."

AUSTIN-WESTERN WORKS
620 Farnsworth Avenue, Aurora, Ill.
Please send complete Gould Certified Report No. 5610.

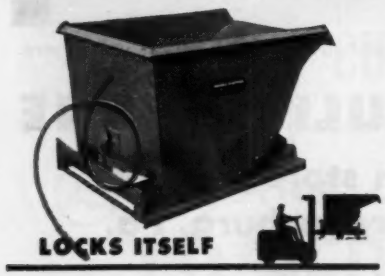
Name.....
Title.....
Company.....
Street.....
City..... Zone..... State.....

AUSTIN-WESTERN WORKS
BALDWIN-LIMA-HAMILTON
Construction Equipment Division
OTHER DIVISIONS: Eddystone • Lima • Electronics & Instrumentation • Hamilton • Loewy-Hydropress • Standard Steel Works • Madsen • Pelton
AURORA, ILLINOIS, U.S.A.

BALDWIN BLH LIMA-HAMILTON

Power Graders • Motor Sweepers • Road Rollers • Hydraulic Cranes

Circle No. 13 on Reader Service Card for more information



pays for itself!

It's the safe, sensible, economical way to handle wet or dry, hot or cold bulky materials. Simple, one-man operation does the job with amazing speed . . . *cuts cost of hand unloading by at least 50%.*

This rugged Roura Self-Dumping Hopper is built to withstand the terrific knocks and bangs of rough usage. Extra heavy gauge metal and welded construction mean years of dependable service. Fits any standard fork or platform lift truck. Also available mounted on live skids or with malleable or rubber tired casters. Sizes from ½ to 2 cubic yards. Thousands in use in America's biggest industries.

ROURA
Self-Dumping
HOPPER

WANT MORE FACTS? Clip this coupon . . . attach to your letterhead . . . sign your name . . . and mail to . . .

ROURA IRON WORKS, INC.
1411 Woodland Ave, Detroit 11, Michigan

Circle No. 137 on Reader Service Card

CHAPTER NEWS

Continued

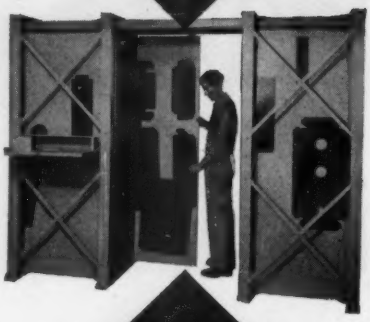
uled so that participants in the seminar have a maximum of flexibility of sessions to attend. At the luncheon session, participants will hear an address on the subject, "Management and the Packaging and Material Handling Engineer".

CLEVELAND, OHIO—At a joint meeting held April 15, members of the local chapters of AMHS and SIPMHE toured the air freight handling facilities of Cleveland Hopkins Airport, courtesy of United Airlines. In addition to the tour, **E. C. Mitchell,** superintendent of cargo service for United, addressed the groups on the various facets of the air freight industry—from helpful ideas on how to prepare products for shipment so that handling and packaging costs are reduced, to the plans already on the books for coping with the problems of the jet age.

ST. LOUIS, MO.—The Missouri Division of SIPMHE had, for the subject of its April meeting, packaging for the armed forces. Speaker was **George Moore,** Chief of Engineering, Packaging Technical Office, Granite City Engineering Depot. His topic was, "Military Packaging as Affected by Supply Facilities in the European Theater".

FLOW's editor, Ed Leighten, has taken to the road to deliver a series of talks on material handling. With suitcase in one hand and typewriter in the other, Ed has been busy talking about "Opportunities Unlimited" to local AMHS chapters and other interested groups. He has already been heard at the Milwaukee (March 16) chapter of AMHS, and will soon speak in Seattle (May 8), Los Angeles (May 9) and San Francisco (May 16). His topic deals with the widening scope of opportunities and responsibilities for material handling and packaging personnel.

NEARLY 3,000 SQ. FT. OF STEEL FILING SPACE IN 25 SQ. FT. OF FLOOR SPACE



WITH
DELUXE
TEMPLA-FILE

No longer will it be necessary to dig through an assortment of patterns wasting valuable time to locate the templates you need. This is a new, practical system for vertical filing and storing of patterns, templates, gaskets, and mockups.

- Eliminates wasted man-hours locating patterns.
- Saves valuable floor space.
- Foldaway reference desk holds handy card index file.
- 24 free-sliding panels each support 600 pounds.
- One Templa-File user states he saved 75% of the time previously used in locating templates.

Call your Deluxe dealer or write for Bulletin No. 100

DELUXE

DELUXE METAL FURNITURE CO., Warren, Pa.
A DIVISION OF THE ROYAL METAL MFG. CO.

Circle No. 43 on Reader Service Card

All 'Round Utility—Mercury "Banty" with special shelf-trailer for maintenance and special parts.

Mercury "Tug" Electric Tractor is ideally suited to installations requiring quiet, fume-free operations.

Transporting over 150 ft.? Use Mercury's Fork Truck "Trackless Train"—one man does work of six.

Have you considered...

the many ways a tractor (gas or electric) can assure you lower handling costs?

One Tractor! Endless Performance! . . . that's the story of Mercury's remarkable versatility. Large or small, your plant and warehouse will stir with a new kind of cost saving activity—as soon as just one Mercury tractor enters your picture.

Mercury "Banty" Gas Tractor powers the "Trackless Train" system. Cuts time, distance and cost.

Snow Plow (or broom) attachment quickly fitted to Mercury tractor. Keeps travelways clear and safe.

Spotting freight cars quickly, easily with Mercury tractor equipped with all-purpose winch.

Plant Tours and Inspection—Mercury "Trackless Train" provides transportation for visitors.

There's a Mercury tractor suited to your needs.
Gas or Electric Models—1000 to 5500 draw bar pull.
ASK FOR A FREE APPRAISAL OF YOUR NEEDS

MERCURY
MANUFACTURING COMPANY

MERCURY
FORK TRUCKS TRACTORS TRAILERS

4154 South Halsted Street, Chicago 9, Illinois

MERCURY MANUFACTURING CO.
I am interested in learning how Mercury tractors can profitably fit into my handling needs. Send free literature.

Name_____
Company_____
Address_____
City_____ State_____

Circle No. 102 on Reader Service Card for more information

Bulk Materials

Whatever your materials handling problem may be, chances are Gifford-Wood can supply you with the right system for the most efficient handling of your products

G-W FLOWMASTER

Here's a unit that combines feeding, conveying, and elevating of a variety of bulk materials, through horizontal, inclined, or vertical planes. A series of solid steel flights attached to an endless chain moves the material in a substantially continuous stream through a totally enclosed, dust-tight (or gas-tight) closely-fitted casing. The Flowmaster is self-loading to proper capacity, self-discharging, and is designed for either continuous or intermittent operation.

G-W OSCILVEYOR

The Oscilveyor is an inexpensive, practical way to move most loose bulk materials—at speeds up to 50 ft. per min. All vibration is put to work by heavy duty reciprocating springs and new-design, rubber-cushioned rocker arms. Provides a uniform continuous flow with low initial cost, low power consumption, a minimum of moving parts and easy maintenance. Compact, easily cleaned.

We will gladly run tests on samples of your bulk material and give you a complete report of our findings and recommendations. Write today.

GIFFORD-WOOD CO.

FREE IDEA BOOK
on engineered materials handling installations
GIFFORD-WOOD CO., Hudson, N. Y.
Please send me complete information on:
☐ The G-W Flowmaster ☐ The G-W Oscilveyor
☐ My free copy of your Idea Book describing G-W installations.

Name_____ Company_____
Address_____
City_____ Zone____ State____ 4444

Circle No. 178 on Reader Service Card for more information

Storage Costs Too High

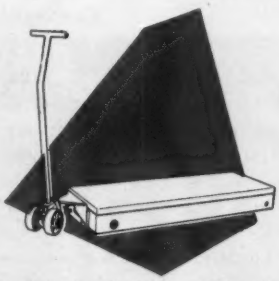
AN IMPRESSION growing of late is that wholesale distributors of such goods as drugs, groceries, metals and clothing are most active in applying mechanized in-and-out material handling systems. If the current trend is continued, it's a good guess that one such distributor is going to have the first truly automatic warehouse.

The principles being applied for wholesale distribution are certainly applicable for in-plant operations. Storage and warehousing are two of the most common of industrial operations. The time required for the storage of materials added to that for holding semi-finished or finished parts in a plant may easily be greater than the total manufacturing time.

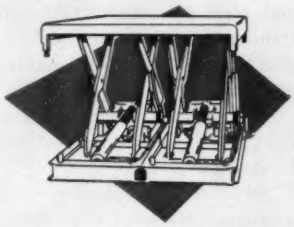
Theoretically, the optimum condition of company economics would exist if no warehousing or storage were required. Practically, the problem is one of maintaining a good flow between incoming raw materials and finished goods continually moving over the shipping dock. Furthermore, as more and more incoming shipments arrive in bulk or increasingly large unit loads, the problem of balance grows rapidly. Every effort must be made to store economically and deliver from storage at controlled rates geared to production or processing demands.

"Control" is the key word. When the feeding of raw materials or parts can be precisely controlled, a company is in a far better position to gauge its storage requirements. Through proper control, dangers of overstocking and understocking can be minimized. Of course, such factors as climatic conditions, markets, availability of materials, and anticipated shortages must enter into the program.

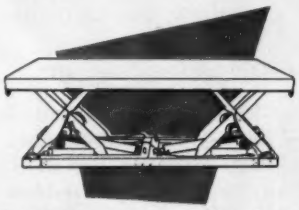
There seems to be readily avail-



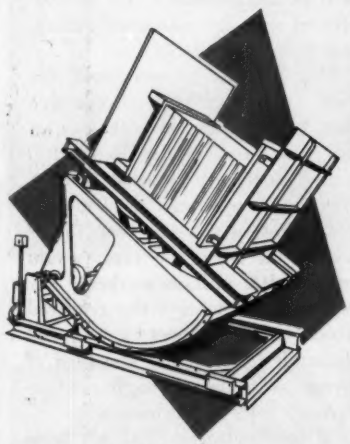
Southworth Portable 2000 lb. Lift Table shown collapsed with dolly. Can be used to shift light loads on short hauls. No installation cost. Simply plug it in.



Southworth Twin (48" x 53" min.) Lift Tables available in varying capacities up to 16,000 lbs. Note entirely self-contained pump assembly and working parts.



Southworth Tandem (24" x 106" min.) Lift Table available also in capacities up to 16,000 lbs. Hinged platform makes servicing easy in totally collapsed position.



Southworth Skid-Turner turns full skid of material in less than three minutes. One man operated. Push button control. Capacity 5,000 lbs.

■ "It can't be done", they said. "You'll never make a lift table with a 30" rise that will slide under a skid and take up to 4000 lbs . . . especially never, with a self-contained motor and pump assembly!"

But the Southworth Portable has all those features. And it can also be used to jockey light loads for short distances to and from the production equipment it serves.

Furthermore, with a complete absence of superstructure comes two more advantages. Not only does the operator have unhampered access to his work from all angles at all times . . . but there is no prescribed position in which this hydraulic powered, scissor-lift *must* be placed at the machine. Side-to or end-to, just plug in the Southworth and it will raise its load in one, or in successive stages, to the working height desired.

BASIC SPECIFICATIONS

Capacities	2000 lb.	4000 lb.	8000 lb.
Platform Size (min.)	19½" x 53"	24" x 53"	24" x 106" 48" x 53"
Collapsed Height	6"	7¼"	7¼"
Extended Height	36"	37¼"	37¼"

Controls . . . . . Foot or Hand Switch

Motors . . . . ½ H.P. single phase 115 volt AC 60 cycle 1725 RPM.

Hydraulics . . . pump actuated ram with relief and solenoid valves.

Larger, or special purpose, platforms available on all standard models. Higher rises (38", 40", 45" and 50") also available in a variety of capacities. Write for specifications on these and on other tables with capacities up to 16,000 lbs.

For Further Details Write: SOUTHWORTH MACHINE CO. since 1890

SOUTHWORTH MACHINE CO.

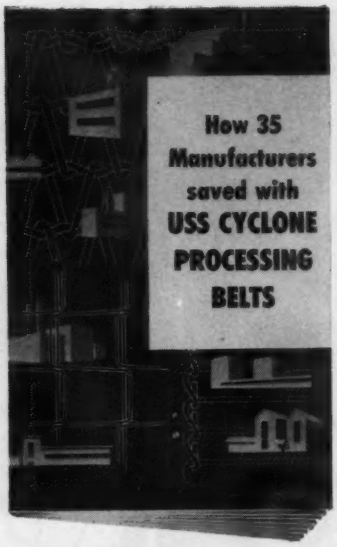
305 WARREN AVENUE, PORTLAND, MAINE

Manufacturers of Paper Conditioners; Automatic Skid Lifts; Skid Turners; Hand, Foot, Motor Driven Punching Machines; Humidifiers; Envelope Presses; Punch Heads; Tabbing Knives and Corner Cutters plus Custom Built Equipment.

ELIMINATE FATIGUE • REDUCE HANDLING TIME • INCREASE PRODUCTION

Circle No. 145 on Reader Service Card for more information

This new booklet can help you

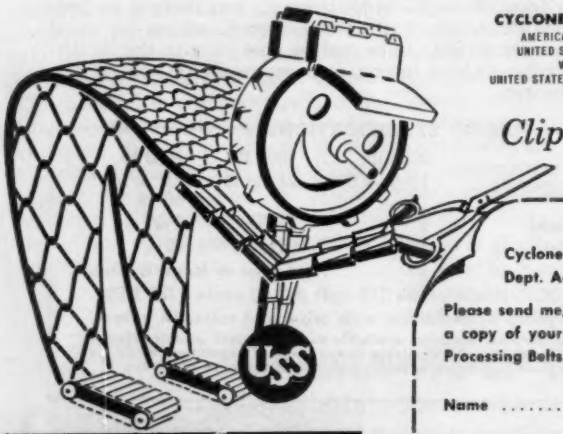


lower production-line costs

Here's a new booklet that's filled with the cost-saving know-how of 35 different manufacturers. It explains how users—moving dozens of different products—have enjoyed worthwhile savings with USS Cyclone Processing Belts. One or more of these case histories is likely to cover problems that exist in your own plant. Knowing how others solved *their* problems can be the first step toward solving your own.

• • •

USS Cyclone Processing Belts are available in many specifications, types and sizes. Every belt is engineered to fit your exact needs. Cyclone Belts do a day-in-day-out job of cutting costs and increasing production over the world, proving their quality and performance time and again. Find how you, too, can enjoy the savings made possible by use of Cyclone Belts. Send for your copy of this new booklet, today.



CYCLONE FENCE DEPARTMENT
AMERICAN STEEL & WIRE DIVISION
UNITED STATES STEEL CORPORATION
WAUKEGAN, ILLINOIS
UNITED STATES STEEL EXPORT CO., NEW YORK

Clip and Mail!

Cyclone Fence
Dept. A-57, Waukegan, Ill.

Please send me, without obligation, a copy of your booklet on Cyclone Processing Belts.

Name .....

Company .....

Address .....

City .....

State .....

USS CYCLONE METAL CONVEYOR BELTS
SPIRAL WOVEN
FLAT WIRE · FLEX-GRID

UNITED STATES STEEL

Circle No. 41 on Reader Service Card for more information

able the tools needed to bring about the controlled storage of almost all materials. And when one considers the high costs of warehousing and storage, there seems to be little doubt but that this industrial area offers one of the most lucrative fields for cost reduction through mechanization. Here is where the work of inventory control can be reduced to that of pushing buttons—where the throwing of a switch or a call through plant communications can start and stop operations from beginning to end—where, ultimately, a computor will work out all details for a long-range warehousing program at the most economical level possible.

So, watch those wholesalers and the engineers working with them. To stay in business, they *must* work constantly to get another fraction of a percent off their operating costs—which are better than 80 percent handling costs.

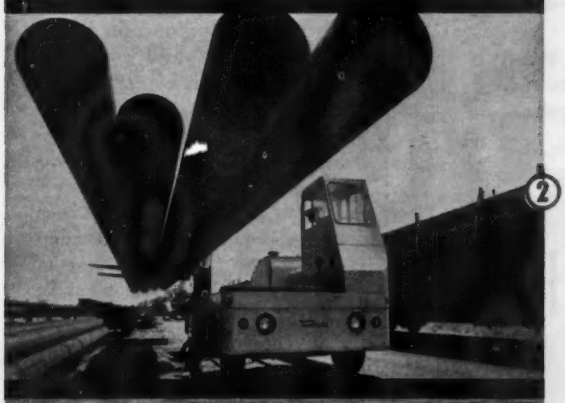
Man Obsoletes Machine

A WORK WEEK shorter than 40 hours just is not possible within the next 20 years, believes D. G. Mitchell, Chairman and President of Sylvania Electric Products Inc. He believes that the increasing rise in our standard of living—expected by everybody over the next two decades—cannot be accomplished with the manpower, alone, that will be available.

Mr. Mitchell recently told the New York Chamber of Commerce that, by 1975, every worker of an estimated force of more than 80 million will have to be on the job 40 hours a week. To reach the 32 hour week, which has been rather widely discussed, he said, would require 102 million workers. The only way to achieve the required production—to meet anticipated demands for a higher standard of living—will be through an increased rate of mechanization.

If mechanization had not been tremendously expanded over the past 10 years, the 1956 work force would have been at least 10 million persons short of the number required to produce last year's

NEW VEHICLES
FOR
NEW PERFORMANCE



VICKERS®

HYDRAULIC SYSTEMS

for All Types of

MOBILE

EQUIPMENT

Vickers Hydraulic Systems make vital contributions to the efficient operation of an extremely wide range of vehicles. To the inherent advantages of hydraulic control, Vickers adds the benefits of a nation-wide and full time field engineering and service organization of unequaled experience. Vickers has the complete line of hydraulic equipment necessary to take undivided system responsibility . . . to eliminate any risk of incompatibility of hydraulic components. Ask for a copy of Bulletin M5101.

VICKERS INCORPORATED
DIVISION OF SPERRY RAND CORPORATION
Mobile Hydraulics Division
Department 1538 • Detroit 32, Mich.

Application Engineering Offices: • ATLANTA • CHICAGO • CINCINNATI CLEVELAND • DETROIT • GRAND RAPIDS • HOUSTON • LOS ANGELES AREA (El Segundo) • MINNEAPOLIS • NEW YORK AREA (Summit, N.J.) • PITTSBURGH AREA (Mt. Lebanon) • PORTLAND, ORE. • ROCHESTER • SAN FRANCISCO AREA (Berkeley) • SEATTLE • ST. LOUIS • TULSA
IN CANADA: Vickers-Sperry of Canada, Ltd., Toronto

Engineers and Builders of Oil Hydraulic Equipment Since 1921

7354

① **AUSTIN-WESTERN HYDRAULIC CRANE**
In addition to power steering, Vickers Oil Hydraulics provide fast, smooth and positive (a) turntable rotation, (b) boom elevation, (c) raising and lowering of load, (d) extending and retracting of boom.

② **BAKER-RAULANG TRAVELOADER**
Vickers Hydraulics provides power steering and multiple movements that enable Traveloader to quickly reach out sideways and pick up a long load, place it on the vehicle's deck for traveling, and then stack it up to 12' high.

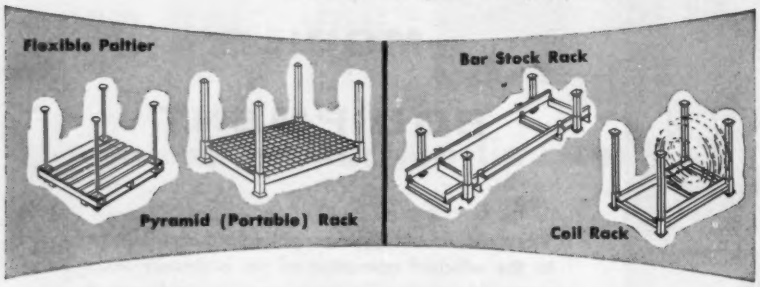
③ **DART UNDERGROUND TRUCK**
Vickers Hydraulics operates the reversible conveyor floor that permits fast and easy trim when loading, and then rapid dumping. Also has Vickers Hydraulic power steering for shuttle operation.

Circle 190 on Reader Service Card for more information

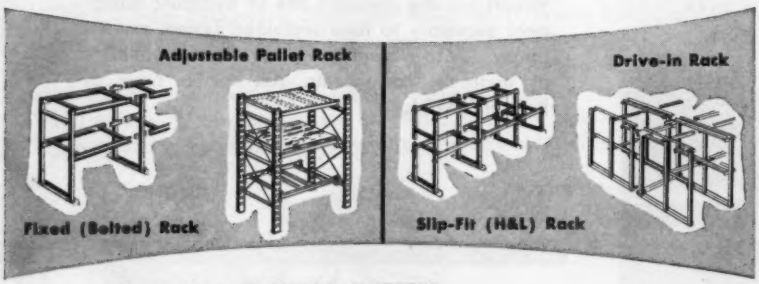
PALTIER SYSTEMS are Best...

INCREASE YOUR PROFITS

and provide maximum safety for your employees.

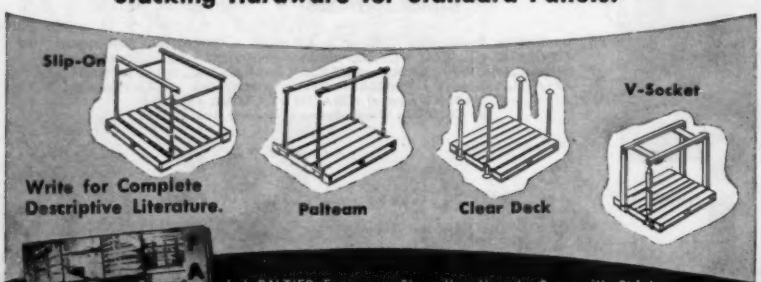


PALTIER engineering has developed storage systems for practically every storage requirement, proving that PALTIER'S experience has no peer.



There is a PALTIER SYSTEM designed especially for your plant.

Stacking Hardware for Standard Pallets.



Let PALTIER Engineers Show You How to Save with Safety

THE PALTIER CORP.

Designers, Engineers and Manufacturers of Engineered Storage Systems

1709 Kentucky Street • Michigan City, Indiana

DISTRIBUTORS IN PRINCIPAL CITIES

Circle No. 118 on Reader Service Card for more information

HIGHLIGHTS

Continued

Gross National Product of $412 billion, Mitchell calculated.

There is no danger that machines will obsolete man, he believes. Instead, man obsoletes machines and builds new and better ones because he needs them to fill his growing requirements.

The "second industrial revolution" is here, Mitchell thinks, because of two major trends—those toward automation and decentralization. These trends "help to prove emphatically the benefits of bigness in business", he said. The non-existence of big business in many other countries does not mean they don't believe in it—they haven't been able to produce it, he claimed. Mechanization, or automation, and decentralization are two of the benefits largely produced by big business. They have made the mass production industries possible—and must be stepped up—is his contention.

Decentralization, as defined by the Sylvania official, is the establishment of autonomous operations of several hundred employees—headed by a manager who has been delegated complete authority and responsibility for the success of that operation. The local plant is, in effect, a local business with all the advantages of participation in a national organization. This plant, then, has access to all the research, development and experience of the whole organization. But it develops greater efficiency through a higher degree of local interest, identification and pride of the employee in his job, according to Mr. Mitchell.

Mechanization and business have progressed together. Mechanization has created millions of jobs, brought about a great expansion of the basic materials industries and produced the need for hundreds of thousands of small businesses to meet the requirements of large manufacturers in the past few years.

Ed Leighton

Editor

SHOW ME YOUR TOUGH LIFTING JOBS!

Here's the hoist to handle them in a hurry. It's the 'Budgit' Aluminum Chain Block. Talk about easy pull; this hoist really has it. One man can lift a 500 lb. load with only 25 lbs. of muscle effort. The ½-ton size weighs only 29 lbs. Easy to carry anywhere a fast lift is needed.

The 'Budgit' Aluminum Chain Block takes hard knocks because super-strength is built into every part from top hook to load hook. Extra safety and efficiency is provided by the big "full jeweled" load brake. It's a fast-acting, automatic brake that makes lowering so smooth and easy loads can be "spotted" with hairline accuracy.

Put the money-saving advantages of the 'Budgit' Aluminum Chain Block to work for you. Spark-resistant models are available for use where such a safeguard is essential. Capacities: ¼ to 10 tons. *Call your nearby "Shaw-Box" Distributor for details or write us for Bulletins 405 and 415.*

I-Beam Trolleys, equipped with ball bearing wheels are available in standard and spark-resistant designs. Plain and hand geared types. Capacities to 20 tons.

Safety Hooks are available to "lock in" slings and other attachments used to support loads. All capacities.

Carrying Case. Heavy canvas riveted to sturdy base plate. Has zipper and leather handle. For 'Budgit' Aluminum Chain Blocks up to 1 ton.

57C-4C

'Budgit'® CHAIN BLOCKS

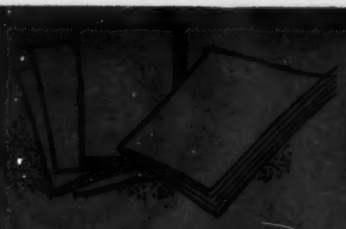
MAXWELL MANNING MM&M MOORE INC. TRADE MARK

MANNING, MAXWELL & MOORE, INC.
SHAW-BOX CRANE & HOIST DIVISION
366 West Broadway • Muskegon, Michigan

Builders of "SHAW-BOX" and 'LOAD LIFTER' Cranes, 'BUDGIT' and 'LOAD LIFTER' Hoists and other lifting specialties. Other Divisions produce 'ASHCROFT' Gauges, 'HANCOCK' Valves, 'CONSOLIDATED' Safety and Relief Valves, 'AMERICAN' and 'AMERICAN-MICROSEN' Industrial Instruments, and Aircraft Products.

In Canada: *Manning, Maxwell & Moore of Canada, Ltd., Avenue Road, Galt, Ontario*

Circle No. 98 on Reader Service Card for more information



CATALOGS

offered in

Fork Truck . . . is said to be especially suited where space is limited. It works with ease inside trailers, freight cars and in aisles too narrow for other similar trucks. Complete data on this truck and case histories of installations which may be similar to yours is offered you by Automatic Transportation Co.

Circle 14 on Reader Service Card

How to Streamline your Shipment Addressing . . . for speed and economy, is the title of a booklet available from Weber Marking Systems Div. of Weber Addressing Machine Co., Inc. It contains such information as how to determine the efficiency of your present shipment addressing operation, the latest direct-to-carton stencilling systems, printing and addressing your shipping labels in one operation, etc.

Circle 105 on Reader Service Card

Two-Way Radio . . . microphone, loudspeaker and controls are mounted in front of driver. Shock mounts protect radio equipment from shock and vibrations. Models for both gas and electric vehicles. Full information is available from Radio Corporation of America.

Circle 133 on Reader Service Card

Automatic Overhead Conveying Systems . . . conveys and stores products from the time they enter as raw materials to the time they leave the plant as finished products. Available with efficient, economical manual or electronic selective controls designed to effectively meet your specific requirements. A catalog giving further information is offered by Richards-Wilcox Mfg. Co.

Circle 139 on Reader Service Card

New-Type Dunnage . . . super-strong, pliable bags inflated with air are being used to replace wooden braces and steel strapping as dunnage. Keeps loads tight and damage-free. Are said to cut shoring time at least 50%. These bags can be used over and over again for years. Full details are available from United States Rubber Co.

Circle 163 on Reader Service Card

Casters and Wheels . . . a catalog on their line of casters and wheels is available from Saginaw Products Corp. They are also offering a catalog on their line of pneumatic wheels.

Circle 139 on Reader Service Card

Steel Shelving . . . is constructed in units which, combined with standard widths, depths and heights of parts and accessories, makes it easy to change and expand. A catalog giving full information is available from Penco Metal Products Div., Alan Wood Steel Co.

Circle 120 on Reader Service Card

Elevated End-Gates . . . features a three-point platform suspension which handles off-center loads better. Has dual controls to permit operation from either side of the truck, away from traffic. Full details are offered in literature from Gar Wood Industries, Inc.

Circle 60 on Reader Service Card

Gummed Filament Tape . . . a sample roll and complete data showing how you can package almost anything better for less is yours for the asking from Mid-States Gummed Paper Co.

Circle 166 on Reader Service Card

Battery Operated Hydraulic Lift . . . 1000 lb. capacity—lifting height 52"—24" x 24" platform. Full information is available from Lee Engineering Co.

Circle 90 on Reader Service Card

Battery Maintenance Record Charts . . . may help you reduce battery costs—save you company money and permit you to be better able to judge the comparative value for each make of battery. Battery life can be extended by consulting these records frequently, thereby assuring the best possible operating procedures. Further information is available from Gould-National Batteries, Inc.

Circle 65 on Reader Service Card

Semi-Live Skids . . . a catalog on their Jak-Tung System for handling semi-live skids for trucking, storing and spotting loads without rehandling is offered you by Thomas Truck & Caster Co.

Circle 154 on Reader Service Card

Template File . . . for vertical filing and storing of patterns, templates, gaskets, and mockups. Has a foldaway reference desk which contains a handy card index file. Twenty-four free-sliding panels each support 600 pounds. Bulletin No. 100 gives all the information and is offered you by Deluxe Metal Furniture Co.

Circle 43 on Reader Service Card

Sprockets . . . with hardened teeth, and up to 7 inches in diameter, available from stock are dealt with in the Grip-Master Sprocket brochure offered by Cullman Wheel Co.

Circle 40 on Reader Service Card

Use This

READER SERVICE CARD

to obtain information on any item in this issue

New Equipment & Supplies ..... Starting on Page 171
Useful Literature ..... Starting on Page 135

FIRST CLASS
PERMIT No. 8066
SEC. 34.9 P. L. & R.
CLEVELAND, OHIO

BUSINESS REPLY CARD
NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

3¢ POSTAGE WILL BE PAID BY: *Reader Service Department*

FLOW

812 HURON RD. • CLEVELAND 15, OHIO

PLEASE PRINT

MAY 1957. Do not use after 8-15-57

Name ..... Position .....

Company ..... Kind of Business .....

Street .....

City ..... Zone..... State.....

PLEASE SEND ME ADDITIONAL INFORMATION AND LITERATURE ON ITEMS CIRCLED BELOW.

1	26	51	76	101	126	151	176	201	226	251	276	301	326	351	376	401	426	451	476
2	27	52	77	102	127	152	177	202	227	252	277	302	327	352	377	402	427	452	477
3	28	53	78	103	128	153	178	203	228	253	278	303	328	353	378	403	428	453	478
4	29	54	79	104	129	154	179	204	229	254	279	304	329	354	379	404	429	454	479
5	30	55	80	105	130	155	180	205	230	255	280	305	330	355	380	405	430	455	480
6	31	56	81	106	131	156	181	206	231	256	281	306	331	356	381	406	431	456	481
7	32	57	82	107	132	157	182	207	232	257	282	307	332	357	382	407	432	457	482
8	33	58	83	108	133	158	183	208	233	258	283	308	333	358	383	408	433	458	483
9	34	59	84	109	134	159	184	209	234	259	284	309	334	359	384	409	434	459	484
10	35	60	85	110	135	160	185	210	235	260	285	310	335	360	385	410	435	460	485
11	36	61	86	111	136	161	186	211	236	261	286	311	336	361	386	411	436	461	486
12	37	62	87	112	137	162	187	212	237	262	287	312	337	362	387	412	437	462	487
13	38	63	88	113	138	163	188	213	238	263	288	313	338	363	388	413	438	463	488
14	39	64	89	114	139	164	189	214	239	264	289	314	339	364	389	414	439	464	489
15	40	65	90	115	140	165	190	215	240	265	290	315	340	365	390	415	440	465	490
16	41	66	91	116	141	166	191	216	241	266	291	316	341	366	391	416	441	466	491
17	42	67	92	117	142	167	192	217	242	267	292	317	342	367	392	417	442	467	492
18	43	68	93	118	143	168	193	218	243	268	293	318	343	368	393	418	443	468	493
19	44	69	94	119	144	169	194	219	244	269	294	319	344	369	394	419	444	469	494
20	45	70	95	120	145	170	195	220	245	270	295	320	345	370	395	420	445	470	495
21	46	71	96	121	146	171	196	221	246	271	296	321	346	371	396	421	446	471	496
22	47	72	97	122	147	172	197	222	247	272	297	322	347	372	397	422	447	472	497
23	48	73	98	123	148	173	198	223	248	273	298	323	348	373	398	423	448	473	498
24	49	74	99	124	149	174	199	224	249	274	299	324	349	374	399	424	449	474	499
25	50	75	100	125	150	175	200	225	250	275	300	325	350	375	400	425	450	475	500

and BULLETINS

advertisements in this publication

Two-Week Retread Service . . . for molded-on solid tires is offered by the Goodyear Tire & Rubber Co. The old rubber is burned off, the wheels shot blasted and inspected. New rubber for each wheel is carefully weighed and molded on to factory specifications. Further information is available from the company.

Circle 63 on Reader Service Card

Hydraulic Pallet Truck . . . allows one man to handle 2000 lb. loads with ease. Its light weight makes it easy to maneuver and pull and lessens operator fatigue. Optional skid adapter also available. Full details are available from The Raymond Corp.

Circle 127 on Reader Service Card

Industrial Liquid Pumps . . . the use of these high vacuum pumps is said to help prevent spilling, slopping, over-filling and dripping. Helps keep plant and work areas cleaner and speeds work, prevents accidents and halts waste. Full information is available from Tokheim Corp.

Circle 156 on Reader Service Card

Cost-Cutting Ideas . . . a series of case histories on how the leaders in steel today utilize Clark Carriers is yours for the asking from Clark Equipment Co.

Circle 36 on Reader Service Card

Heavy-Duty Fork and Ram Trucks . . . which offer such features as dual drive motors for maximum power and flexibility—narrower overall width—picture window vision—hydraulic power steering and power brakes are described in literature available from the Elwell-Parker Electric Co.

Circle 52 on Reader Service Card

Mechanical Brains . . . are a part of a new handling system to control movement and lower costs. You can read all about it in a free brochure "Controlled Flow in Action" available from The Rapids-Standard Co., Inc.

Circle 125 on Reader Service Card

Portable Bag Closer . . . handles all types of bags. Requires no installation—just plug into any outlet. Simple to operate and maintain and weighs only 10½ lbs. Details available from Dave Fischbein Co.

Circle 57 on Reader Service Card

Stacking Racks . . .made of strong, tubular steel—adjustable to fit any space or unit load. Special racks designed to your specifications with field engineering service on any installation. An illustrated catalog giving full information is offered by Equipment Mfg., Inc.

Circle 53 on Reader Service Card

Collapsible Pallet Boxes . . . come in three models—plain, open front and drop leaf. A complete line for all types of material handling. A bulletin giving further information is offered by the Bigelow-Garvey Lumber Co.

Circle 22 on Reader Service Card

Crane Scale . . . eliminates double handling. Loads can be checked on the spot as they are moved—the instant they are lifted. No need to pick up, mov scale, set down and then p again. Illustrated literat offered you by W. C. Dillon Inc.

Circle 46 on Reader Servic

Tote Boxes . . . stacki nesting type. Made of a ri heavy duty corrugated boa is strong, lightweight and d Have bail handles of 7-gag rod that flip in for stackin flip out and down for n Full details are offered by C Inc.

Circle 179 on Reader Servic

Bulk Material Tran Body . . . designed for c salt, sand or any free flowi terial. Has a new 9 in. no ging auger at the bottom body. Unloads one to two to minute, depending on the m Scientifically sloped sides constant feed to the auger. lustrated catalog is being by Baughman Mfg. Co.

Circle 19 on Reader Servic

Production Line Sealin of cartons with mechanical ment can be accomplished th the use of sealing tapes by can Sisalkraft Corp. Facts the labor saving uses of Sis reinforced tape are contai literature offered by the co

Circle 10 on Reader Servic

Portable Conveyor . . . for truck loading and us stairways is described in lit available from The Belt Cor

Circle 20 on Reader Service

ick up, move to a
n and then pick up
rated literature is
W. C. Dillon & Co.,

eader Service Card

s . . . stacking and
Made of a rigidized
rrugated board that
weight and durable.
dles of 7-gage steel
n for stacking, and
down for nesting.
offered by Convoy,

eader Service Card

rial Transport
signed for cement,
ny free flowing ma-
ew 9 in. non-clog-
the bottom of the
one to two tons per
ing on the material.
loped sides assure
o the auger. An il-
g is being offered
Mfg. Co.

eader Service Card

Line Sealing . . .
mechanical equip-
complished through
ng tapes by Ameri-
Corp. Facts about
g uses of Sisalkraft
are contained in
d by the company.

eader Service Card

onveyor . . . ideal
ing and use over
cribed in literature
The Belt Corp.

ader Service Card

Use This

READER SERVICE CARD

to obtain information on any item in this issue

New Equipment & Supplies .....Starting on Page 171
Useful Literature .....Starting on Page 135

PLEASE PRINT **MAY 1957. Do not use after 8-15-57**

Name ..... Position .....

Company ..... Kind of Business .....

Street .....

City ..... Zone..... State.....

PLEASE SEND ME ADDITIONAL INFORMATION AND LITERATURE ON ITEMS CIRCLED BELOW.

1	26	51	76	101	126	151	176	201	226	251	276	301	326	351	376	401	426	451	476
2	27	52	77	102	127	152	177	202	227	252	277	302	327	352	377	402	427	452	477
3	28	53	78	103	128	153	178	203	228	253	278	303	328	353	378	403	428	453	478
4	29	54	79	104	129	154	179	204	229	254	279	304	329	354	379	404	429	454	479
5	30	55	80	105	130	155	180	205	230	255	280	305	330	355	380	405	430	455	480
6	31	56	81	106	131	156	181	206	231	256	281	306	331	356	381	406	431	456	481
7	32	57	82	107	132	157	182	207	232	257	282	307	332	357	382	407	432	457	482
8	33	58	83	108	133	158	183	208	233	258	283	308	333	358	383	408	433	458	483
9	34	59	84	109	134	159	184	209	234	259	284	309	334	359	384	409	434	459	484
10	35	60	85	110	135	160	185	210	235	260	285	310	335	360	385	410	435	460	485
11	36	61	86	111	136	161	186	211	236	261	286	311	336	361	386	411	436	461	486
12	37	62	87	112	137	162	187	212	237	262	287	312	337	362	387	412	437	462	487
13	38	63	88	113	138	163	188	213	238	263	288	313	338	363	388	413	438	463	488
14	39	64	89	114	139	164	189	214	239	264	289	314	339	364	389	414	439	464	489
15	40	65	90	115	140	165	190	215	240	265	290	315	340	365	390	415	440	465	490
16	41	66	91	116	141	166	191	216	241	266	291	316	341	366	391	416	441	466	491
17	42	67	92	117	142	167	192	217	242	267	292	317	342	367	392	417	442	467	492
18	43	68	93	118	143	168	193	218	243	268	293	318	343	368	393	418	443	468	493
19	44	69	94	119	144	169	194	219	244	269	294	319	344	369	394	419	444	469	494
20	45	70	95	120	145	170	195	220	245	270	295	320	345	370	395	420	445	470	495
21	46	71	96	121	146	171	196	221	246	271	296	321	346	371	396	421	446	471	496
22	47	72	97	122	147	172	197	222	247	272	297	322	347	372	397	422	447	472	497
23	48	73	98	123	148	173	198	223	248	273	298	323	348	373	398	423	448	473	498
24	49	74	99	124	149	174	199	224	249	274	299	324	349	374	399	424	449	474	499
25	50	75	100	125	150	175	200	225	250	275	300	325	350	375	400	425	450	475	500

FIRST CLASS
PERMIT No. 8066
SEC. 34.9 P. L. & R.
CLEVELAND, OHIO

BUSINESS REPLY CARD
NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

3¢ POSTAGE WILL BE PAID BY: *Reader Service Department*

FLOW

812 HURON RD. • CLEVELAND 15, OHIO

CATALOGS AND BULLETINS

Continued

Reinforced Sealing Tape . . . Glas-Sert is reinforced in both directions with Rayon and Fibreglass strands. It is said to be especially suitable for high speed automatic taping machines and saves two-thirds the time when cartons are sealed by hand. Further information is available from Rexford Paper Co.

Circle 131 on Reader Service Card

Hydraulic Crane . . . has large tires and 4-wheel power steering which give remarkable maneuverability. Boom can be extended and retracted at the same time it swings or the crane moves forward or back. Full details are available from Austin-Western Works.

Circle 13 on Reader Service Card

No Bolting or Welding . . . is required to erect storage racks by American Metal Products Co. Assures quick and easy access to all items. Protects stocks against damage. Speeds inventory taking. Has many other benefits which are discussed in literature available from the company.

Circle 7 on Reader Service Card

Pressed Steel Swivel Casters . . . available in 2, 2-½, 3, 4, 5 and 6-inch diameter semi-steel or solid rubber tread wheels. Capacities range from 75 through 500 pounds. Literature is available from Bond Foundry & Machine Co.

Circle 24 on Reader Service Card

Lift-Truck Accessibility . . . is stressed in the all-new Clarklift 50. The hood swings back in seconds revealing every part of the engine for routine maintenance. Brakes are self-adjusting. One multiple plug disconnects the entire electrical system. Bearings sealed in wheel hubs eliminates replacement or repacking every time a wheel is removed. Further details are available from Clark Equipment Co., Industrial Truck Div.

Circle 35 on Reader Service Card

Hydraulic Tail Gate . . . now available for capacities up to 4000 lbs. One lever controls all gate operations from either side of the truck. Gate automatically stops if driver takes hand off lever. Will not operate if overloaded. Descriptive literature is available from the Anthony Co.

Circle 11 on Reader Service Card

Sheet Lifter . . . permits one man and an electric hoist to handle five tons of sheet steel with speed, safety and economy. Adjustments permit the lifter to shift from wide to narrow sizes in a few seconds. Capacities from 2 to 60 tons. A bulletin giving full information is offered you by Cullen-Friestedt Co.

Circle 39 on Reader Service Card

Tire and Wheel Analysis . . . without cost or obligation, a B. F. Goodrich representative will study your equipment, loads, hauling surfaces and any special problems you may have. Further particulars are available from the company.

Circle 62 on Reader Service Card

Take-Up Reel . . . a heavy duty hoist reel with a rating of 15 amps, 550 volts, AC—250 volts DC. Feeds and retrieves power cord in any direction to double track coverage. Neoprene covered cables seal out moisture, oil, and chemical fumes. A bulletin giving full particulars is offered you by Appleton Electric Co.

Circle 16 on Reader Service Card

Low Overhead Electric Hoists . . . cuts overhead space requirements. Five types available to lift from ¼ to 12 tons. Features one-hand operation and antifriction bearings throughout. Literature is available from American Engineering Co.

Circle 6 on Reader Service Card

Magnetic Belt Conveyor . . . with special A-F engineered drive which replaces old fashioned pusher bar booster is one of the systems discussed in their Bulletin of Engineered Conveying Systems offered you by The Alvey-Ferguson Co.

Circle 4 on Reader Service Card

Automatic Electric Tape Dispenser . . . measures and cuts up to 105 inches accurately. Selecta-matic keyboard permits two operators to work side by side without conflict. Also has a thermostatically controlled water heating unit. An illustrated brochure giving full particulars is offered you by Ideal Stencil Machine Co.

Circle 75 on Reader Service Card

Dock Covers . . . completely enclose the space between car and building doorways protecting workers and merchandise during loading and unloading operations in bad weather. Helps prevent accidents. Insures against loss of heat or refrigeration. Full details are available from CAPCO.

Circle 31 on Reader Service Card

Flexible Conveyor Belting . . . has a short turning radius, is light in weight and easily installed and maintained. An illustrated catalog giving full details is yours for the asking from Ashworth Bros., Inc.

Circle 181 on Reader Service Card

Short Case Sealer . . . increases packaging efficiency Glues, folds and seals either or both top and bottom flaps in one operation—automatically. Details, floor plans and specifications are offered you by the A-B-C Packaging Machine Corp.

Circle 17 on Reader Service Card

Framing Material . . . no drilling or welding is required when using this material. Merely cut and bolt the pieces together to your exact specifications. The "Dexion Construction Guide" is the title of a construction guide offered you by Acme Steel Co., Dexion Div. which describes this material and its uses.

Circle 1 on Reader Service Card

Electric Tractor . . . for hauling one or multiple units with speed, safety and ease of operation is discussed in a bulletin available from Lift Trucks, Inc. Can pull loads of 6000 lbs. or more.

Circle 93 on Reader Service Card

Conveyors . . . Standard Conveyor Co. designs and builds permanent and portable systems and units, using roller, belt, slat, chain, pushbar or sectional conveyors—power or gravity and also spiral chutes and pneumatic tube systems. A bulletin giving full details is offered by the company.

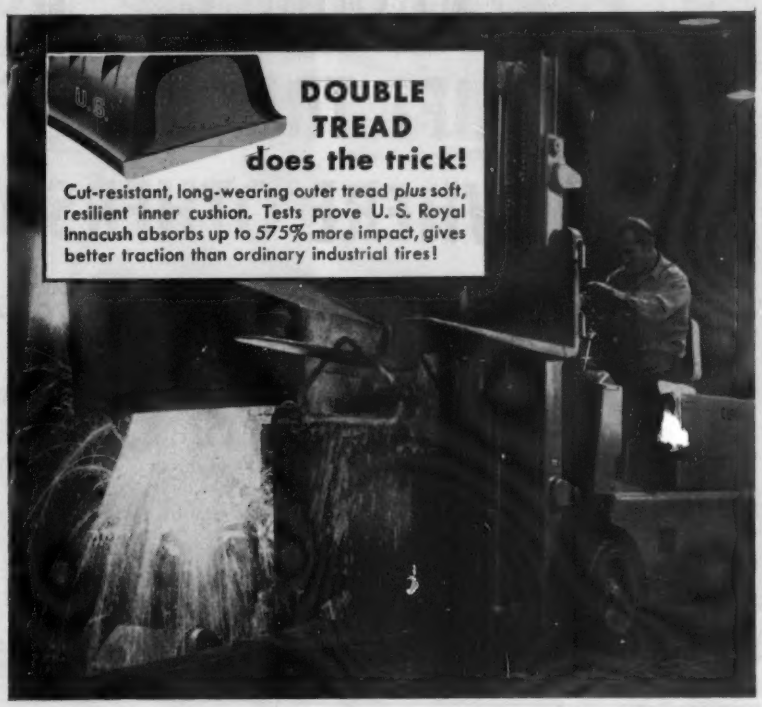
Circle 146 on Reader Service Card

General Service Crane . . . for use in a variety of jobs requiring highly dependable service. Carries a 35-ft. boom which may be extended to 70 feet. The machine has high maneuverability and great stability as well as independent power boom hoist. Complete information on the 22-B crane is yours for the asking from Bucyrus-Erie Co.

Circle 27 on Reader Service Card

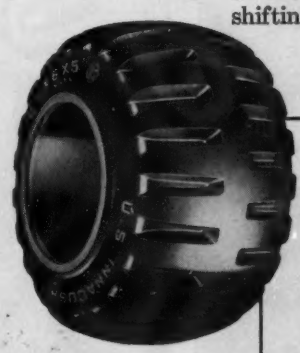
Processing Belts . . . a new booklet explains how users moving dozens of different products have enjoyed worthwhile savings with

5½ times more cushioning!


DOUBLE TREAD does the trick!
Cut-resistant, long-wearing outer tread *plus* soft, resilient inner cushion. Tests prove U. S. Royal Innacush absorbs up to 575% more impact, gives better traction than ordinary industrial tires!

U.S. ROYAL
INDUSTRIAL TIRES

You really save material-handling expense with the 5½-times-softer ride the U.S. Royal Innacush gives your industrial trucks. You save loads from shifting and breakage. You save on vehicle maintenance. And you save drivers from operating fatigue!



NEW—COMPLETE—FREE! SEND COUPON TODAY

Mr. C. E. Drennan, Manager, Industrial Tires,
United States Rubber,
Rockefeller Center, New York 20, N. Y.

Please rush me your new, authoritative manual on industrial tires.

NAME_____

ADDRESS_____

CITY & STATE_____

US RUBBER **United States Rubber**

Rockefeller Center, New York 20, N. Y. In Canada: Dominion Rubber Co., Ltd.
When in New York visit the United States Rubber Exhibit Hall in Radio City

Circle No. 162 on Reader Service Card for more information

Automatic DOCKER

THE LIFT TRUCK THAT WORKS WHERE OTHERS CAN'T

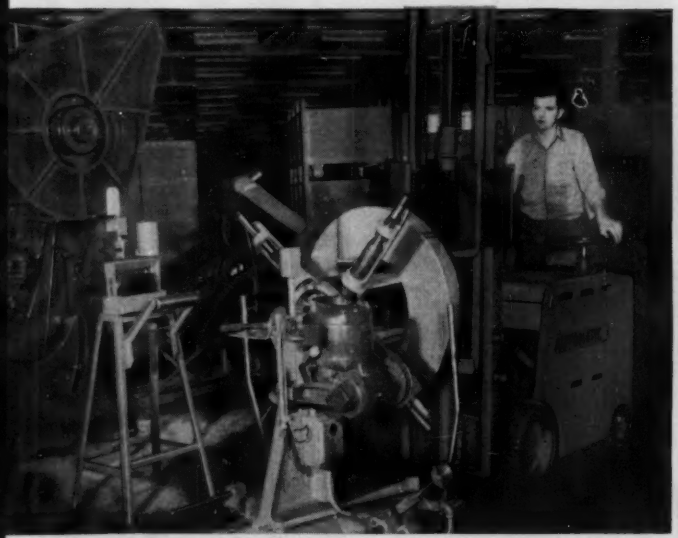
Shortest in its class... unmatched for easy maneuvering ...and for efficient low-cost operation

Illustrated are only a few examples of the DOCKER'S versatility. This extra-compact, more maneuverable truck offers more advantages than any other of its type for materials handling in any industry. It is especially desirable where space is limited ...works with ease inside trailers, freight cars and in aisles too narrow for other similar trucks.

What's more, direct comparison shows clearly how definitely superior the DOCKER really is. Here are the figures:

	DOCKER	TRUCK A	TRUCK B	TRUCK C
2000 LBS. WITH LOAD LENGTH OF ▶	48"	30"	48"	30"
SHORTER.....OVERALL LENGTH LESS FORK	53⅞"	65⅞"	65½"	64"
SAFER...EASY ON EASY OFF.....STEP HEIGHT	7"	13"	13¾"	13⅞"
MORE PRODUCTIVE.....LIFT SPEED F.P.M.	65	55	45	45
MORE VERSATILE.....GRADE CLEARANCE	45%	43.4%	45%	35%
MORE MANEUVERABLE.....TURNING RADIUS	56"	59"	64"	57"
MAXIMUM HEAT PROTECTION.....CLASS H, SILICONE INSULATED MOTORS. ALL MODELS	Yes	No	No	No

Send today for complete information including case histories of installations similar to your own where Dockers are cutting materials handling costs to a minimum (see coupon at bottom of next page).



FABRICATED METALS—DOCKER is placing steel coil on an automatic feed device for a punch press in the new Briggs and Stratton Plant, Milwaukee. Throughout this plant, which is a model for plant planners, DOCKERS keep materials moving from receiving through production to shipping.

FOOD AND COLD STORAGE—Operating in temperatures ranging from plus 38° to minus 10° F. dependable Automatic DOCKERS working around the clock speed handling of perishable foods for Inland Storage Company.

BULK CHEMICALS—DOCKER equipped with revolving carriage fork which takes about 2 minutes to load 2200 lbs. of raw chemicals into bin. The Climalene Company has established a new system of handling dry chemicals in bulk, thereby avoiding necessity of building additional facilities.

PAPER—Marcal Paper Company slashes loading time per boxcar from 12 man-hours to 1½ man-hours. DOCKER illustrated is equipped with rotating paper roll clamp for unloading and tiering 800 lb. paper rolls.

TOOLS AND METAL SPECIALTIES—Nye Tool Company uses the DOCKER and one man part time for a loading job that formerly took several men away from other work.

PHARMACEUTICALS AND CHEMICALS—Illustrated is DOCKER with removable drum attachment unloading a trailer load of Citroflex® plasticizers at warehouse of Chas. Pfizer & Co., Inc. 40 drums of nearly 600 lbs. each are unloaded in only 40 minutes.

Circle No. 14 on Reader Service Card for more information

FREE DOCKER BROCHURE

Complete data on the Automatic DOCKER is yours for the asking. Also case histories of installations similar to yours. Just attach this coupon to your company letterhead and sign your name. Address AUTOMATIC . . . Dept. E-7, 141 West 87th Street, Chicago 20, Illinois.

PACKS
TWICE
The POWER*
OF ORDINARY
WALKIES!

Model WL4F
Capacity:
4,000 lbs.

*12 volts for normal operation - -
24 volts for extra power!

NEW RAYMOND® Walkie

BY USING four 6-volt auto batteries (rather than a single 12-volt industrial battery) the Raymond Walkie gives you dual voltage . . . 12 volts for all normal operations, plus a surge of 24 volts for long hauls and for negotiating steep ramps with full capacity loads.

This totally new Walkie offers you other distinct advantages too. For example, 3 separate speeds, forward and reverse . . . an exclusive safety control to protect the operator in tight spots . . . convenient, handle-located operating controls . . . greater maneuverability for working in narrow aisles . . . lighter overall weight without sacrificing capacity or durability.

Clip & Mail!

The RAYMOND CORPORATION
3323 Madison St., Greene, N.Y.

Rush me full details on your new RAYMOND Walkie. ☐ Send Bulletin. ☐ Have representative call.

NAME _____ TITLE _____
COMPANY _____
STREET _____
CITY _____ STATE _____

Circle No. 126 on Reader Service Card for more information

CATALOGS

Continued

U.S.S. Cyclone Processing Belts. One or more of these case histories is likely to cover problems that exist in your own plant. Knowing how others solved their problems can be the first step toward solving your own. It's yours for the asking from Cyclone Fence Dept., American Steel & Wire Div., U. S. Steel Corp.

Circle 41 on Reader Service Card

Portable Conveyor . . . has exclusive zig zag grids that support both sides of each ball-bearing wheel. Narrow packages ride smoothly between the side rails, or the conveyor sections can be inverted to handle overhanging loads. Details are available from The American Pulley Co.

Circle 9 on Reader Service Card

Automatic Carton Closing . . . this twin-end stapler automatically closes both ends of carton at the same time. Automatically adjusts to a wide variety of carton sizes and shapes. Full particulars are given in an illustrated brochure offered by International Staple & Machine Co.

Circle 80 on Reader Service Card

Overhead Hoist . . . is lightweight and features low-headroom —distance between track and eye of hook measures only 21 inches. Dual braking and inching control are other features. Full information on their "Big Lift" Hoists is available from R. G. LeTourneau, Inc., Industrial Equipment Div.

Circle 85 on Reader Service Card

Magnesium Ramp . . . features slanting safety side-rails which protect ramp, equipment, tires and workers and prevent run-off. Constructed of all welded, lightweight magnesium. Positive locking device holds ramp in position. Further information is available from Penco Engineering Co.

Circle 119 on Reader Service Card

Circle No. 14 on Reader Service Card for more information

For Special Fume Problems . . . a catalytic exhaust purifier that works with leaded gasoline is available from Oxy-Catalyst, Inc. Carbon monoxide, hydrocarbons, exhaust fumes and odors can now be safely controlled with the new Oxy-Muffler. Details are available from the company.
Circle 116 on Reader Service Card

Demountable Rubber Wheel . . . is said to outlast molded-on rubber wheels by 2 to 35 times. Tires replaceable in five minutes. Details available in a bulletin published by The Rapids-Standard Co., Inc.
Circle 124 on Reader Service Card

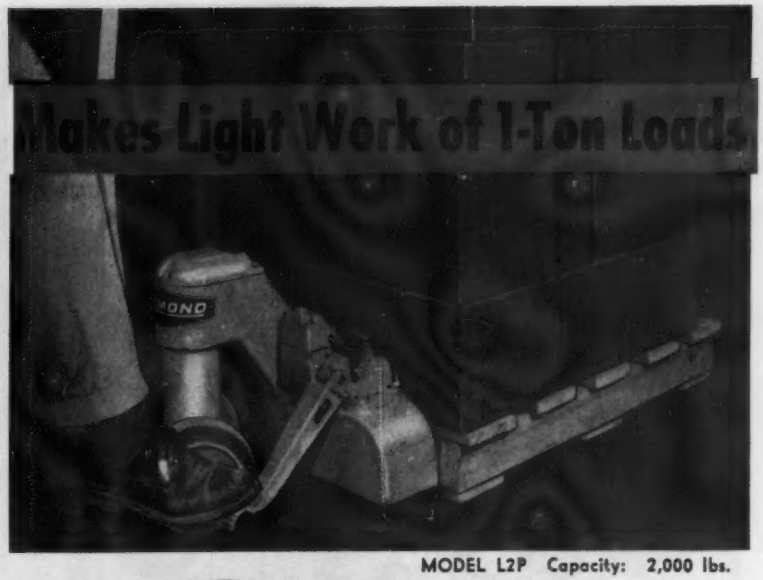
Print Shipping Information Direct . . . on cartons, boxes, packages. Eliminate double operation of preparing labels and then pasting them to the containers. Get 1,000 or more impressions from one stencil without re-inking. Literature and a free form-cut stencil and print are offered by The Multistamp Co.
Circle 109 on Reader Service Card

One-Man Car Door Opener . . . opens any box car door in 20 seconds or less with little effort. Multiplies one man's strength a hundred-fold. Details available from The Nolan Co.
Circle 113 on Reader Service Card

Steel Shelving . . . and steel shop equipment are described in literature available from Neiman Steel Equipment Co., Inc.
Circle 112 on Reader Service Card

Crane Attachments . . . a complete line of lifts, grabs and tongs for handling sheet steel, angles and barrels is the subject of literature available from Merrill Brothers.
Circle 103 on Reader Service Card

New Model Power Sweeper . . . the new Tennant Model "80" sweeps most main aisles in two passes or less. Exclusive brush-vacuum system assures nearest approach to 100% dust-free sweeping yet developed. High airflow



MODEL L2P Capacity: 2,000 lbs.

RAYMOND Lightweight

HYDRAULIC PALLET TRUCK

ONE MAN can handle 2,000 lb. loads with ease with the Raymond Lightweight Pallet Truck. Because this truck lets hydraulic power do your heavy lifting . . . frees 2 or 3 men for other work.

Lightweight makes it easy to maneuver and pull, lessens operator fatigue. Ruggedly constructed to withstand years of use and abuse. Offers effortless pallet entry, foot pedal lifting and lowering. Little wonder this Raymond Truck is the world's most popular pallet truck!

Handles skids too

Optional Skid Adapter lets Raymond Pallet Truck handle 2,000 lb. skid loads. Hinged superstructure raises out of way when handling pallets, lowers into position for handling skids.

BULLETIN ON REQUEST

The RAYMOND CORPORATION
3325 Madison St., Greene, N.Y.

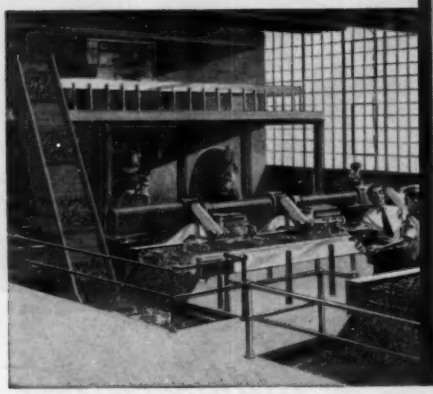
☐ Send Lightweight Pallet Truck bulletin.
☐ Send Pallet Truck Skid Adapter information.

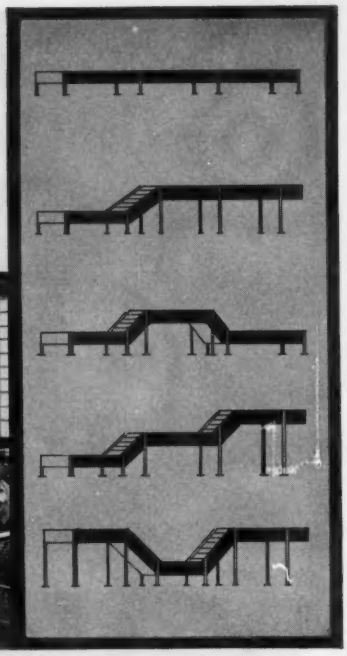
NAME _____ TITLE _____
COMPANY _____
STREET _____
CITY _____ STATE _____

Circle No. 127 on Reader Service Card for more information

MAY-FRAN

CONVEYOR STANDARDIZATION





. . . SAVES YOU MONEY

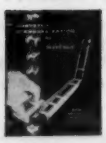
. . . NOW AND IN THE FUTURE!

Here is a conveyor program designed for the unusual. NOW . . . you can have a customized conveyor today to meet production needs . . . and with modification, that same conveyor will meet the needs of tomorrow.

The May-Fran conveyor standardization program provides the standard components that can be assembled to form a special or standard conveyor. These same components can be re-arranged at any time to solve production problems in the future.

In addition, standard components mass produced mean conveyor economy right from the beginning.

Here is a conveyor program of standardization program that saves you money now . . . and in the future!



Write today for your copy of Bulletin MF-200

7320-MF

MAY-FRAN ENGINEERING, INC.

1611 Clarkstone Rd., Cleveland 12, Ohio

Circle No. 100 on Reader Service Card for more information

CATALOGS

Continued

fan sucks dust through largest filter area provided on any sweeper. Details are available from G. H. Tennant Co.

Circle 152 on Reader Service Card

Lift Truck Attachments . . . for moving loads faster, easier and with more safety. Roll clamps, carton clamps, rotators, side shifters, stabilizers, box dumpers, crate clamps and others are described in literature available from Universal Clamp Co.

Circle 184 on Reader Service Card

Walkie-Type Trucks . . . which offer such features as electric-hydraulic lift, simple controls, ball bearings turntable, double wheel support, etc. are described in a catalog available from The Moto-Truc Co.

Circle 108 on Reader Service Card

Hydraulic Lift Trucks . . . a new 24-page catalog which shows more than 40 Big Joe Models ranging up to 2000 pounds in capacity and with lifting heights to 130" is available to you from Big Joe Mfg. Co.

Circle 23 on Reader Service Card

Belt Conveyor Idlers . . . the Joy Limberoller is a single roll idler consisting of pressure-molded neoprene discs on a flexible steel cable which turns on its own axis. Only two bearings are used and these are up and out of the dirt zone. Works well with coal or chemicals, ores, fertilizers and other difficult materials. A detailed booklet is available from Joy Mfg. Co.

Circle 83 on Reader Service Card

Skids . . . bolted and welded construction of C-type skids which feature easy deckboard replacement. Full range of sizes, types, capacities and underclearances available. Literature is offered by Ironbound Box & Lumber Co.

Circle 81 on Reader Service Card

NOW...ON BANTAM SELF PROPELLED
a "dual purpose" 15-ft. boom

works inside
—with low gooseneck boom

works outside
—with straight boom

cuts time and costs on all jobs!

The BANTAM Self-Propelled is now more versatile and profitable than ever. With this specially designed, dual-purpose 15-ft. boom you can work both inside and out. All you do is add a wedge insert which gives a 25° gooseneck offset for inside jobs where space and headroom are limited.

Then, for fast, cost-cutting, outside lifting, loading, stacking or other handling jobs, the wedge is removed. Presto—you've got the regular, high-lift straight boom. One man makes the change in minutes. Either way, you get the same big 6-ton lifting capacity.

Wherever you're working—in-plant handling and maintenance or at outside yard assignments—you've got the same one-man, one-engine, all-purpose machine with exceptional maneuverability . . . independent travel with no-shift forward and reverse . . . 360° swing . . . power up and power controlled lowering for precise, safe handling. And it works and earns with BANTAM's full line of digging and handling attachments.

Get an on-the-job demonstration right now; see your BANTAM distributor.

SCHIELD Bantam Co.

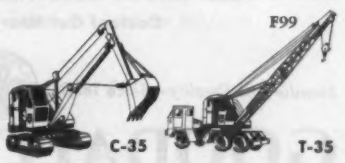
251 Park Street, Waverly, Iowa, U.S.A.

WORLD'S LARGEST PRODUCER OF TRUCK CRANES AND EXCAVATORS

I want information on BANTAM CR-35 with new gooseneck boom.

☐ Also details on carrier mounted BANTAM.

☐ On crawler mounted BANTAM.



Name_____

Position_____

Company_____

Address_____

City_____ State_____

Circle No. 141 on Reader Service Card for more information

GOODALL BELTING

Always the Answer to Lower Handling and Replacement Costs...

"SUPER TRIPLE-S". Goodall's finest Bulk Conveyor Belting . . . with a long-established record for outstanding quality and reliability. Used for handling crushed stone up to 10", ores, slag and other abrasive materials, wet or dry.

"TRIPLE-S" and "La Crosse" will serve with equal efficiency and economy in less severe services.

"HI-CLIMBER". (R) The Incline Conveyor Belting with a special "Diamond"-Grip molded surface that keeps packages from sliding or slipping on inclines up to 30°. Other brands available for flat or incline conveyors.

"SKY-KLEET". (R) The name that identifies specially-designed rubber cleats available on Goodall Conveyor Belting used for handling packages, small parts, stampings, minerals, chemicals, etc., on fixed or portable conveyors. Cleats are integrally molded to the belt, and spaced at any required distance.

"POWER KING" *High Capacity* V-BELTS

Built with larger, stronger, endless twin grommets to transmit greater H.P. This means fewer belts per drive, reduction in over-all weight, and less space required for any given load. The only high-capacity belts with so little stretch that the efficiency of the drive is not affected.

Greater flexibility gives "Power King" V-Belts one-third more gripping power than other types . . . they pull heavier loads.

Switch to "Power King" V-Belts, and note the savings they assure through increased capacity and efficiency.

"If it's GOODALL, it MUST be GOOD!"

Contact Our Nearest Branch for Details and Prices

Standard of Quality—Since 1870

HOSE • BELTING • FOOTWEAR • CLOTHING
AND OTHER INDUSTRIAL RUBBER PRODUCTS

GOODALL *Rubber Company*

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.
Branches and Distributors Throughout the United States and in Canada

Circle No. 191 on Reader Service Card for more information

CATALOGS

Continued

Twice the Power of Ordinary Walkies . . . by using four 6-volt auto batteries rather than a single 12-volt industrial battery, the Raymond Walkie gives dual voltage. Also offers three separate speeds, forward and reverse and safety control. A bulletin is available from The Raymond Corp.
Circle 126 on Reader Service Card

Conveyor Switch . . . conveys loads to the right, to the left and straight through. Rollers are concentric at any setting to assure positive line of travel without guard rails. Can be used with curves and straight sections. Literature is available from Metzgar Conveyor Co.
Circle 104 on Reader Service Card

101 Cost-Cutting Ways . . . is the title of a booklet available from Coles Cranes, Inc. It shows how flexible, fast, and safe Coles mobile cranes can do more jobs better for less.
Circle 38 on Reader Service Card

Pneumatic Hoist . . . with rotary air motor—capacities from 250 lbs. to one ton is described in literature available from Detroit Hoist & Machine Co. The pulseless, rotary air motor has no pistons and no reciprocating parts.
Circle 44 on Reader Service Card

Marking Attachments . . . the compact Rolacoder machine marks one, two or four sides of cartons, cases, drums, bags, etc.—and all automatically. A new bulletin describing the machine is offered you by Adolph Gottscho, Inc.
Circle 64 on Reader Service Card

Fork Trucks . . . which are said to lower operating costs, cut maintenance costs and permit you to move more tonnage per hour, per dollar are discussed in literature available from Lamson Mobilift Corp.
Circle 87 on Reader Service Card

(Continued on page 96)

2 new ELPAR® Fork Truck Series

DOUBLE-DUTY

"Safe-Hite" Fork Trucks

These ELPAR electric trucks operate in street trucks, tunnels, basements—wherever limited headroom is a factor. Upright design also permits high stacking in storage. The model pictured, for example, is only 68″ high, yet has a lift of 100″.

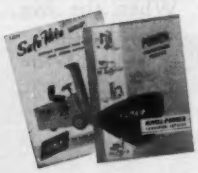
Operator safety is assured, despite the extremely low truck height. He sits 18″ lower than on conventional models . . . his head is below the top of the uprights. Completely new engineering of frame and other units accomplishes this without sacrificing operator visibility, comfort or efficiency. Capacities: 2000, 3000, 4000 pounds.

HEAVY-DUTY

Fork and Ram Trucks

These rugged giants take overloading and rough treatment in stride. They are the culmination of Elwell-Parker's 50 years' experience in the steel industry—the toughest lift truck proving ground of all.

ELPAR heavy-duty electric trucks are packed with features like *dual drive motors* for maximum power and flexibility . . . *narrower overall width* . . . *picture-window vision* . . . *hydraulic power steer* . . . *power brakes* . . . and many other design features that assure dependable performance year after year. Available with forks or rams in capacities from 20,000 to 80,000 pounds.



GET FULL DETAILS on these and other trucks in the complete ELPAR fork truck line. Write for General Catalog and Individual Truck Bulletins.

THE ELWELL-PARKER ELECTRIC COMPANY

4235 ST. CLAIR AVENUE • CLEVELAND 3, OHIO

Circle No. 52 on Reader Service Card for more information

NEWS VIEWS TRENDS

Fibre Box Competition Announced

New Directions in Packaging will be the theme of the 1957 Fibre Box Competition to be held by the Fibre Box Association in Washington, D. C. on October 17 and 18. Box manufacturers will compete for awards in ten different end use classifications which include various commonly used products. In addition, awards will be made in six specialty classes.

Yale Builds Arkansas Plant

Construction of a new $4 million Yale Material Handling Equipment manufacturing plant and mid-continental parts depot will begin shortly in Forrest City, Arkansas, according to Elmer F. Twyman, vice president of The Yale & Towne Manufacturing Company. Located on a 35-acre lot, the plant will have more than 157,000 square feet of operating space. When completed this summer, it will be the center of production for the complete line of Yale hand trucks and hand hoists, now manufactured at the company's material handling equipment plant in Philadelphia, Pa. In addition, it will be a major depot for the stocking of replacement parts for the complete lines of Yale material handling equipment. This will provide more rapid and efficient service to customers, company sales branches and dealers in the growing mid-continental industrial area.

Clark Announces Two Expansions

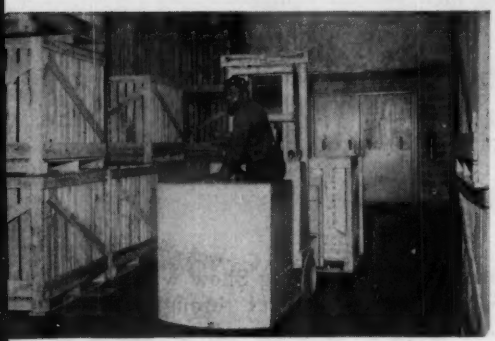
Clark Equipment Company has announced that it is building a 300,000 square foot building in Chicago, and expanding its Construction Machinery Division plant in Benton Harbor, Mich. by 63,000 square feet. The Chicago structure, due for completion June 1, is of one-story brick and steel design. It is located in the Clearing Industrial District, and has a rail connection. Total floor space of the Construction Machinery Division plant in Benton Harbor will be brought up to a half-million square feet when its new addition is completed, also in June. It is the fourth expansion of the plant, which was built in 1954.

LeTourneau Re-Enters Earthmoving Field

R. G. LeTourneau, who until four years ago was among the world's leaders in the earthmoving equipment industry, will re-enter the field in 1958 after a five year absence. LeTourneau sold the earthmoving division of his business to Westinghouse Air Brake Company in 1953, and included in the $31 million sale was an agreement that he would refrain from building and selling earthmoving equipment for a period of five years, ending May 1, 1958. After the sale his firm, located in Longview, Texas, continued to operate in such fields as logging, off-road transportation, heavy material handling and other forms of custom engineering. When the five years has expired, the firm will produce a line of earthmoving equipment under a new trade name—"AR-GEE" instead of the familiar "LeT". Equipment in this line will feature a new "electric wheel" system, with high-torque electric motors geared directly to the inside of each wheel, and powered by diesel-electric dynamos similar to those on modern diesel locomotives.

L-S ELECTRICS FOR LIFT TRUCK SAVINGS

L-S Model "E" Electrics equipped with special 180° rotating attachment now dump 2000 lb. loads of raw potatoes directly into processing hopper. With this new bulk method, every L-S truck at H. W. Lay & Company handles up to 80 tons of potatoes a day!



Here, L-S electric fork lift stacks boxes four high to 20' . . . adds thousands of feet of storage space with less floor area! Box pallets each hold a ton of unbagged potatoes. Slatted sides allow air to circulate and reduce potato shrinkage.

Trailing high, bulky loads is simple and safe with L-S Electrics. Exclusive Standrive position gives operator greater freedom getting on and off . . . full visibility when traveling in forward or reverse.

SAVED: $160,000 in one year!

At H. W. Lay & Company, Atlanta, Ga. . . . project manager, Mr. H. C. Waggoner estimates, "The use of Lewis-Shepard trucks will save us at least $20,000 in labor alone over the hand and jack truck methods formerly used. This, added to savings in space, results in a total saving of $160,000 in our first year!"

Using four L-S Model "E" Electrics . . . Lay and Company now stores and handles potatoes by the bulk ton. Most important, these high-stacking lift trucks doubled overhead storage space . . . reclaimed over 20,000 sq. ft. of valuable floor area for productive use.

Lay's also chose L-S Electrics because fumes and food don't mix. The Model "E" is clean, silent . . . works without odors, smoke, oil or grease stains. What's more, compare gas vs. electric truck costs. For low-cost maintenance and full-time dependability . . . you'll choose L-S, too, because it's your best truck buy! Mail coupon for full information.

Here's a list of important companies that have recently reordered L-S Model "E" Electrics:

	Now in use	Reordered
Electrical Goods Mfg.	110	24
Overland Express	81	23
Office Supply Mfr.	17	2
Refrigeration Plant	10	4
Food Chain	3	7

L-S LEWIS-SHEPARD®
The most complete line of materials handling equipment anywhere

The "MASTER" Line

135 Walnut Street, Watertown 72, Mass.

Please send me:
☐ L-S Model "E" Catalog #32-1 ☐ L-S MASTER Line Catalog ☐ L-S "Gas vs. Electric Cost Study"

Name..... Title.....

Company.....

Address.....

City..... State.....

Circle No. 92 on Reader Service Card for more information

Continued

Link-Belt Speeder Ups Production Facilities

The second major plant expansion in two succeeding years has been announced by Link-Belt Speeder Corporation, a subsidiary of Link-Belt Company. This expansion will increase by 40 percent the firm's production facilities in Cedar Rapids, Iowa, for the production of power cranes and shovels. According to company officials, the move is planned to take full advantage of the substantial sales potential in the nation's long range road building program. Link-Belt Speeder builds 27 models of crawler and rubber tired shovel-cranes.

Penn State U. Offers Automation Seminar

An extensive seminar on automation will be held on the campus of The Pennsylvania State University June 9 through 14, 1957. Latest techniques related to the development of automation equipment will be presented for manufacturing and design engineers responsible for the design, installation and operation of equipment for automated production. Half of the program will be devoted to workshop sessions, covering methods of design of basic and advanced mechanical, pneumatic, hydraulic and automatic control systems.

Dravo to Build Handling Equipment

Entry into the field of material handling has been announced by Dravo Corporation. The firm has been licensed by Carl Schenck Company, Germany, to manufacture Schenck-designed vibrating feeders, screens and conveyors in this country. Key feature of the machine is an exciter element which imparts a "micro-thrust" movement to materials being moved or screened. In the initial stages of its operation, Dravo will import these exciter units, but will manufacture the other components of the equipment.

Chase Bag Completes Plant Addition

Completion of a new building adjoining its plant in Portland, Oregon has been announced by the Chase Bag Company. The structure is 160 x 170 feet, and is designed for maximum efficiency in warehousing and manufacturing. The two buildings now give Chase more than two acres of floor space. Other West Coast facilities include a plant in Los Angeles and several sales offices.

Western Maintenance Show Features Conference

The 3rd Western Plant Maintenance & Engineering Show will be staged in Civic Auditorium, San Francisco, June 11 through 13. One of its features will be a Maintenance and Engineering Conference, which will be held concurrently with the show. The agenda for the conference has been planned to appeal especially to plant personnel expected to attend from the 11 western states.

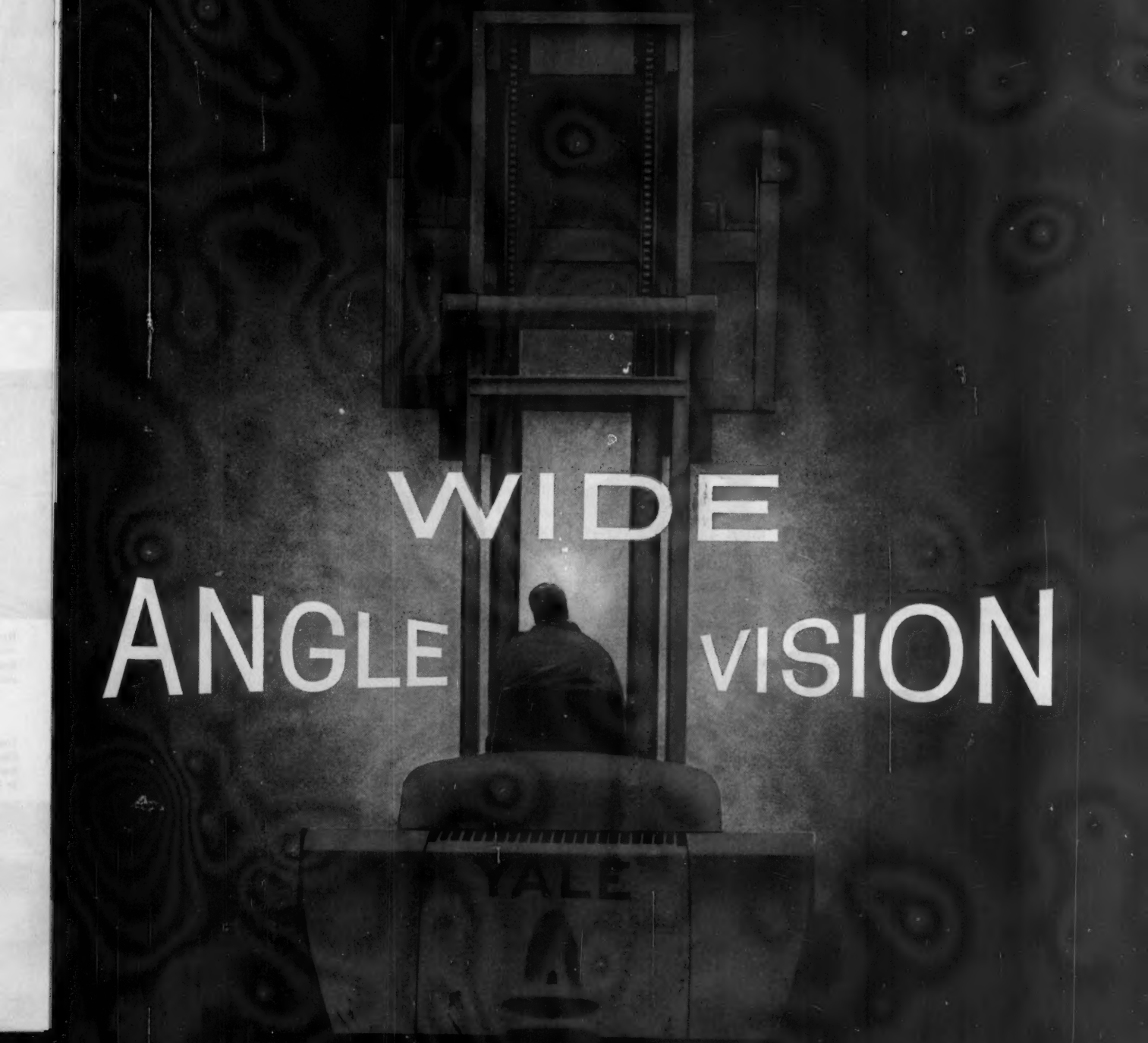
Army to Sponsor 1957 Symposium on Packaging, Handling

The United States Army, in cooperation with all military services, the Department of Commerce and the National Security Industrial Association, will sponsor the Third Joint Military-Industry Packaging and Material Handling Symposium on October 1, 2 and 3 at Fort Lee, Virginia. Theme of the conference will be "Packaging and Material Handling in Action". Top level defense and industrial leaders will address the meetings, and exhibits and field demonstrations will be featured. Firms and individuals can get further information from: Procurement Division, Deputy Chief of Staff for Logistics, Department of the Army, Washington 25, D. C.

FLOW
Circle 168 on Reader Service Card

YALE BUILDS FOR THE NEW ERA

New Yale High-Capacity Gas Trucks Featuring...



WIDE ANGLE VISION

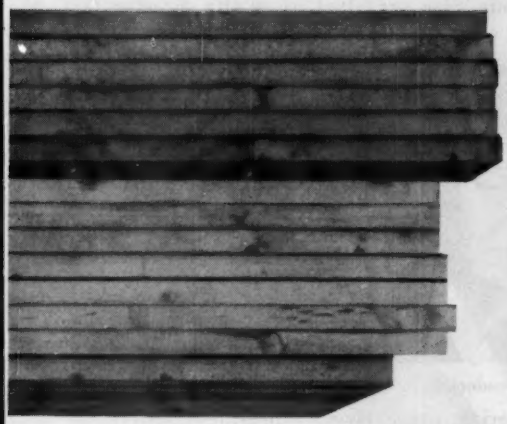
First and only gas truck in

Major advance in fast cycle handling of heavy loads of lumber, construction materials, paper, primary and fabricated metals, brick and clay products, concrete; goods and cargo handled in truck terminals, in warehouses, on waterfronts.

To meet the need of expanding industries for better materials handling methods, look to Yale for further advances in research, engineering, manufacturing, sales and service—as

YALE BUILDS FOR THE **NEW ERA**

15,000-20,000 lb. capacity with full visibility



YALE

WIDE-ANGLE VISION

300% MORE VISIBILITY THAN ANY OTHER TRUCK OF ITS TYPE! Not just straight-ahead vision—but "corner of the eyes" vision, too—*fully functional* visibility with the big, open look of new Yale High-Capacity Gas Trucks. Operator sits high and in center. Upright channels are wide-spaced, nested to reduce frontal obstruction. Right next to them—the hoisting cylinders, one right, one left. Chains that raise carriage are in front of cylinders—*out* of the arc of vision.

Carriage has one top bar, one bottom bar—good visibility between them at all levels of fork lift. Channel cross members are at channel ends—none between. When an attachment is used, hydraulic hoses are located in front and behind cylinders—not in the line of sight. Whether looking forward or to the rear, the operator sees more. Result: these new Yale trucks with "Wide-Angle Vision" promote safer, faster, more efficient handling of 15,000 to 20,000 lb. loads.

GREATER STABILITY. Lifting, lowering, traveling—these Yale trucks keep capacity loads in precision balance! Minimum weaving with full loads, because the trucks are built low—low center of gravity, with high underclearance. Extremely rugged design. Broad lifting base afforded by two ball-mounted lift cylinders. Wide channel-roller spacing at all points of lift, plus side-thrust rollers on channels and carriage, further increase stability factor. Large-size, high-flotation tires give good traction under severest terrain conditions.

FAST CYCLE OPERATION. New Yale High-Capacity Gas Trucks have lifting speeds up to 60 feet per minute; fast, safe lowering; travel speeds up to 20 miles per hour; easy maneuverability.

TOP PERFORMANCE UNDER TOUGHEST CONDITIONS

Here are just a few of the premium engineering features—all included as *standard*—that give new Yale Gas Trucks a big edge in stamina and safety under all conditions:

- I-beam side members in frame for extra strength.
- Channels mounted on ball-bearing rollers to reduce friction and wear.
- Ball-mounted, self-aligning hoisting cylinders.
- Gear shift lever, plus hoist, tilt and attachment lever at right side of driver. Directional control lever conveniently located on steering column.
- Power steer with two balanced hydraulic cylinders, one to each rear wheel, to reduce stress on bearing points and linkage.
- Your choice of Yale Fluid Coupling or standard transmission.

Designed for complete selection of attachments—engineered for a minimum loss distance.

YALE*

*REG. U. S. PAT. OFF.

INDUSTRIAL LIFT TRUCKS AND HOISTS

YALE & TOWNE

The Yale & Towne Mfg. Co., Materials Handling Div. Manufacturing Plants in Philadelphia, Pa., and San Leandro, California

The YALE & TOWNE Manufacturing Co., Dept. A-45
Roosevelt Blvd., Philadelphia 15, Pa.

Please send the new Yale High-Capacity Gas Truck brochure No. 5230.

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

In Canada: write The Yale & Towne Manufacturing Co., St. Catharines, Ontario, Canada

Gasoline, Electric & LP-Gas Industrial Lift Trucks • Worksavers • Warehousers • Hand Trucks • Hand and Electric Hoists

Circle No. 168 on Reader Service Card for more information

MEN in the NEWS

At Wisconsin Motor Corporation . . . two new vice presidents have been elected by the board of directors, according to **H. A. Todd,** president. They are **F. Burrows Esty,** chief engineer, and

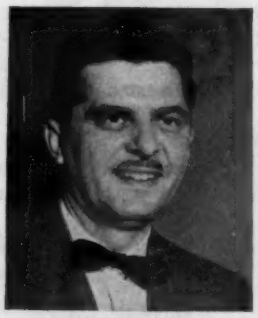
F. B. Esty

R. J. Fellows

Ray J. Fellows, sales manager. Esty has been with Wisconsin since 1948, joining as assistant chief engineer and becoming chief engineer in 1955. Fellows joined the firm in 1938 as a salesman, and has been domestic sales manager since 1954.

At **Koehring Company** . . . a major personnel shift has brought **E. O. Martinson,** president and general manager of Koehring-Waterhous Ltd., Brantford, Canada to the firm's central office in Milwaukee. He assumes the newly created post of vice president in charge of research and development for Koehring's eight divisions and sub-

E. O. Martinson



D. W. Marchant

sidiaries. **D. W. Marchant,** current vice president and general manager of Koehring Southern, Chattanooga, Tenn., will move up to the Koehring-Waterhous position vacated by Martinson. He will be succeeded by **Harry S. Jeske,** now general superintendent at Koehring Southern. Jeske in turn will be succeeded by **Loring Click,** presently assistant to the works manager at the Milwaukee plant.

At **Bemis Bro. Bag Company** . . . President **F. G. Bemis** has announced the retirement of **C. W. Loomis,** vice president, company director and director of personnel. Loomis is succeeded by

F. V. Deaderick

R. V. Scott

F. V. Deaderick, presently vice president, director of eastern operations and also a company director. Replacing Deaderick is **R. V. Scott,** former manager of the Chicago general sales division.

At **Link-Belt Company** . . . two new directors were elected at the 1957 annual meeting of the company's stockholders, according to **Robert C. Becherer,** president. They are **John A. Metz, Jr.,**

J. A. Metz, Jr.

R. E. Whinrey

of Pittsburgh, Pa. and **Richard E. Whinrey,** of Indianapolis, Ind. Metz is a partner of the Pittsburgh law firm of Metz, McClure & MacAlister. Whinrey is vice president of Link-Belt and general manager of the company's Ewart plant in Indianapolis.

At **General Box Company** . . . the appointment of three new vice presidents has been announced by **J. A. Cragwell,** president. They are **John M. Ladd, Alan L. Irwin** and **Charles C. Bush.** Ladd for the past nine years has been manager of the

There's a
BONUS PROFIT
in "automation" with...

APPLETON REELITE®

Constant, Trouble-Free Traveling Power...335° Swivel

"Automation"... the newest concept of automatic industrial production... can be more completely achieved with APPLETON *Reelite* "YS" Series automatic reels for supplying power to moving machinery. APPLETON *Reelites* will help you solve many industrial problems involving moving equipment.

The "YS" *Reelite* is a quality product... engineered for long service and low-maintenance dependability. There's a style and model for every job... and to help you in your manufacturing processes, we've prepared Bulletin 504 to aid in your selection ... send for it today!

WHY APPLETON REELITES ARE BETTER

- Feeds and Retrieves power cord in any direction (335° swivel) to double track coverage
- Enclosed copper graphite and collector rings eliminate dangers of exposed collectors, trolleys, etc.
- Neoprene covered cables seal out moisture, oil,chemical fumes
- Easy to maintain. Power spring, brushes, etc., removed through outer cover. Solderless cord connections, and oilless bearings
- A heavy duty hoist reel... Rating: 15 amp., 550 v., AC: 250 v., DC.

Sold Exclusively Through Selected Wholesalers

APPLETON ELECTRIC COMPANY
1729 Wellington Avenue • Chicago 13, Illinois

Also Manufacturers of:

Explosion-Proof Fixtures

Unilet Fittings

Industrial Lights

"ST" Series Connectors

Outlet Boxes

Rely on APPLETON *... The Standard for Better Wiring*

Circle No. 16 on Reader Service Card for more information

ONE TRUCK.

ONE PLANT . . . or a HUNDRED.

Whether you operate at one location or have plants scattered coast to coast, each truck enjoys almost "factory-town" service when you standardize on Allis-Chalmers.

Near each plant is a qualified dealer with a well-equipped service department, parts stocks, and factory-trained sales and service personnel. A nearby factory branch backs up each dealer with additional parts stocks and factory servicemen and sales engineers. This assures prompt and proper attention for every truck and every material handling problem.

For dependable performance — one truck or a thousand, in one plant or a hundred, let us or your Allis-Chalmers material handling dealer give you more reasons why . . .

You're Wise to SPECIFY.

ALLIS-CHALMERS, MATERIAL HANDLING DEPARTMENT, BUDA DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

8H-47

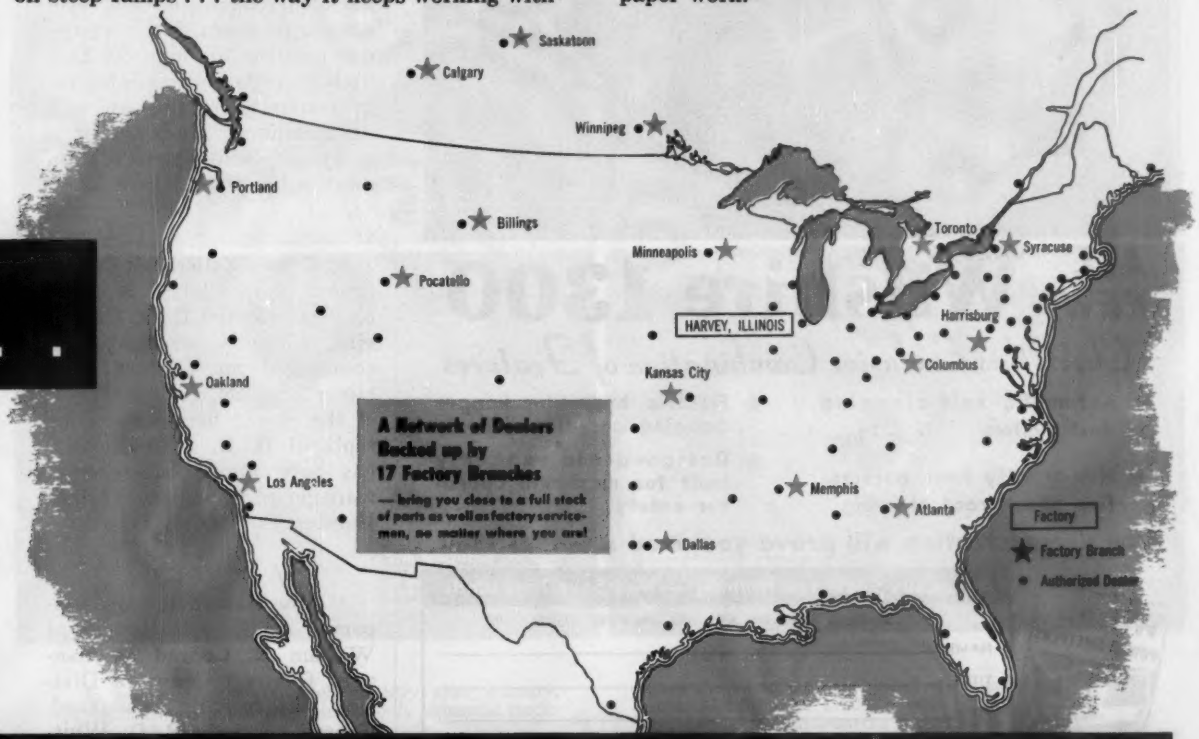
"It's the workingest truck in the business!" says the owner of one Allis-Chalmers fork truck. When an Allis-Chalmers truck goes to work, the owner gains a new concept of lift truck performance. The way it feels to the operator, nimble yet solid, fa-

. . or a THOUSAND

miliar as a car . . . the way it makes extra trips every hour . . . the way it handles capacity loads on steep ramps . . . the way it keeps working without downtime — these are just a few of the differences that convince the owner his choice was right.

As he uses the truck, an owner appreciates more and more the heavy-duty Allis-Chalmers industrial-type engine — the strong construction throughout, typified by exclusive automotive-type frame — the extreme ease of servicing.

While these advantages are valuable to the single truck owner, they are *multiplied* for fleets. And owners of Allis-Chalmers fleets gain a big bonus advantage. There is an amazing parts interchangeability within trucks in the Allis-Chalmers line. This saves valuable bin space, reduces parts investment, gets trucks back to work faster, cuts down paper work.



. . Allis-Chalmers Fork Trucks!

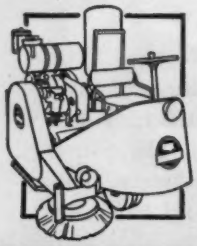
Allis-Chalmers Fork Lift Trucks to match your needs

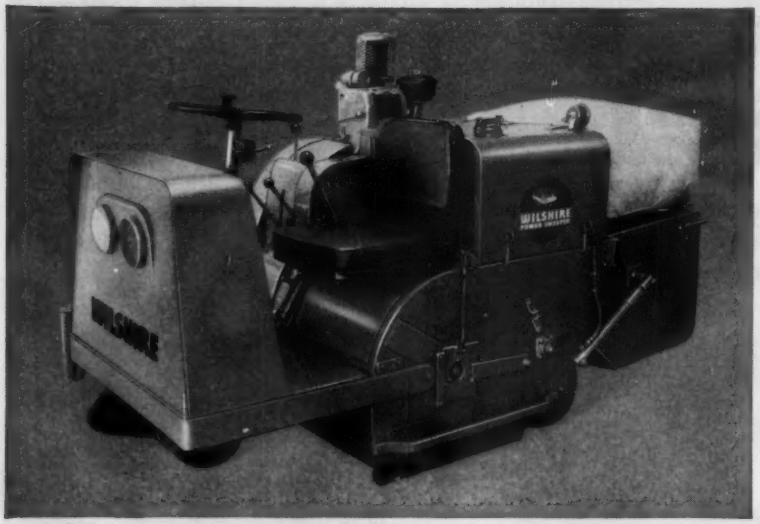
Capacities from 2,000 to 8,000 lb
Choice of fuels — LP gas, diesel or gasoline
Torque converter or standard transmission
Solid, cushion or pneumatic tires
Attachments to fit the material and job

Circle No. 28 on Reader Service Card for more information

FOR YEARS WILSHIRE HAS OUTSWEPT EVERY BROOM'N SWEEPER THE WORLD OVER!

NOW Power Swept Design and Years Ahead Engineering brings you the...





ALL NEW Wilshire 1300

Check this Exclusive Combination of Features

- ★ Automatic self-cleaning dust system
- ★ Heavy duty Ross automotive shockproof steering
- ★ Electric hydraulic hopper dumping and flap lift
- ★ Designed and ruggedly built for maximum operator safety

One demonstration will prove you need a Model 1300

An Inquiry Costs You Nothing — May Save Thousands

PLEASE SEND BULLETIN NO. J-57 ON NEW MODEL 1300

NAME_____

TITLE_____

FIRM_____

STREET_____

CITY_____ STATE_____

Wilshire
Power Sweeper Company
ELGIN, ILLINOIS • GLENDALE 4, CALIFORNIA

DISTRIBUTORS IN ALL PARTS OF THE U S A
FOR CANADA: Plant Maintenance Equipment Ltd., Vancouver, Montreal, Toronto
FOR EXPORT: The HOMS Company, 44 Whitehall St., New York 4, N.Y.

Circle No. 189 on Reader Service Card for more information

firm's design and testing laboratories. Irwin was formerly manager of the Detroit plant. Bush has been in charge of the Cincinnati plant.

At **Atlantic Gummed Paper Corp. . . . S. W. Franklin** is appointed vice president for marketing. The announcement was made by **Saul Warshaw,** president of the firm. Franklin was formerly general sales manager of Hudson Pulp & Paper Corp.'s Cup and Container Division. He will be responsible at Atlantic for the development of an entirely new sales, merchandising and promotion program. He is recognized within his industry as a leading authority on sales organization, marketing and selling techniques. He is author of many published articles on these subjects.

At **Crown Zellerbach Corporation** . . . the board of directors has elected **C. S. Cullenbine,** formerly secretary and counsel of the Gaylord Container Division, as secretary of of the parent firm. Cullenbine replaced **D. R. Schmidt,** who has been appointed general manager of Canadian Western Lumber Company Limited.

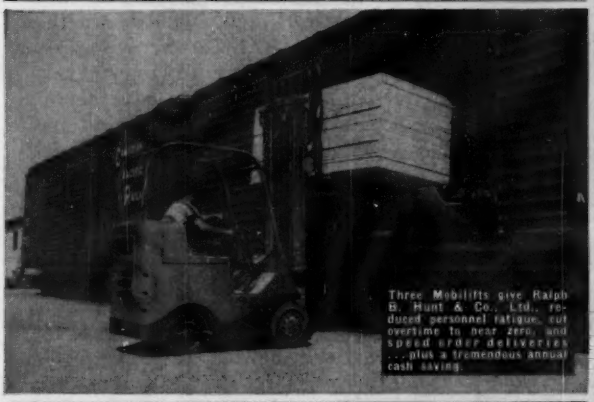
At **Joy Manufacturing Company** . . . the appointment of **William R. Conrad** as manager, Contract Conveyor Division was recently announced. Conrad succeeds **R. G. Whitnall,** who retired earlier this year. He will be charged with the management of a department which is directed toward the engineering and selling of complete, custom material handling systems.

At **Clark Equipment Company . . . Steve Ragsdale** is appointed manager of the Materi-

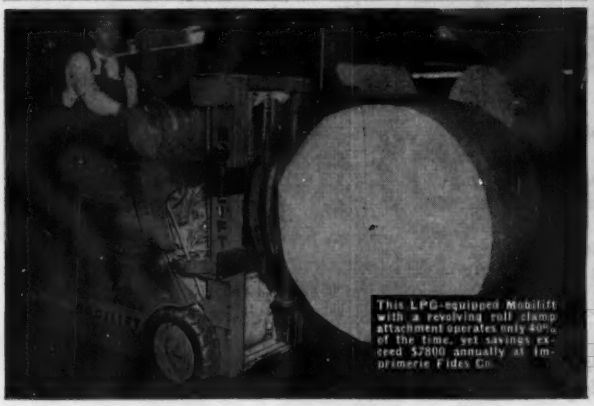
these MOBILIFT owners lift profits, lower costs

This Mobilift with LPG has lowered the cost of receiving, in-process handling, warehousing and shipping for the Chemical Corp.

One Mobilift handles all warehousing plus order selecting for over 200 stores served by Voss Grocery Co.


Three Mobilifts give Ralph B. Hunt & Co., Ltd., reduced personnel fatigue, cut overtime to near zero, and speed order deliveries ... plus a tremendous annual cash saving.

This 2000 lb. capacity Mobilift—one of 3 at Tide-water-Cleveland Storage Corp.—easily pushes a 9000 lb. load to storage, saves four trips.


This LPG-equipped Mobilift with a revolving roll clamp attachment operates only 40% of the time, yet savings exceed $7800 annually at Imprimerie Fides Co.

Hubbard & Co. specified Mobilifts because they operate in less space ... move more tonnage at lower cost in its plant and warehouse.

In company after company, industry after industry, Mobilift owners tell us they are the *only* industrial trucks which slash handling costs by:

1. Lowering operating costs
2. Cutting maintenance costs
3. Moving more tonnage per hour per dollar

Here are some of the reasons why: *Mobil-Matic* Drive* is the simplest, easiest-to-maintain automatic transmission on the market. *Finger-Tip Controls* provide a new standard of easy handling in the industrial truck field. *Hydra-Lizer** on "Sit-Downs", exclusive hydraulic equalizing rear suspension system automatically cross-compensates for floor variations up to 3". *Fluid Coupling* on "Sit-Downs", gives the smoothest, cushioned starts and stops of any truck. Mobilifts are available with factory-installed LPG equipment, and time-saving attachments for specialized operations. "Stand-Up" models up to 3500 lb. capacities; "Sit-Down" models up to 5000 lb. capacities.

Free! Valuable Information

- How Mobilifts' exclusive features save dollars by increasing efficiency is described in this "Sit-Down" folder.
- This brochure describes the cost-saving features of the only "Stand-Up" line of gas-operated trucks on the market.

*Trade Mark

LAMSON MOBILIFT® CORP 25 Lamson Street, Syracuse 1, New York

Mobilift Sales and Service is Available in 75 Cities Throughout the U. S. and Canada

Circle No. 87 on Reader Service Card for more information

MEN IN THE NEWS

Continued

al Handling Development Center, according to **L. A. DePolis,** general manager of Clark's Industrial Truck Division. Ragsdale will be responsible for coordinating research projects of the center. Current projects include development of ground handling equipment for use with jet airliners and studies of special techniques for handling such products as bagged sugar and cement.

At **Edgar's Warehouses, Inc.** . . . new vice president in charge of warehousing for this Detroit firm of 15 general warehouses is **M. Lownsbury.** Formerly general manager of Railway Warehouses, Inc., Lownsbury will be in charge of sales and operations in his new capacity with the Edgar firm.

At **Hewitt-Robins Incorporated** . . . **Arnold W. Asman,** head of Pennsylvania State University Department of Mining, has been appointed product manager of mining equipment sales. He succeeds **R. U. Jackson,** who will be assigned to the sale of large conveyor contracts and will also be available for consultation on mining problems.

At **Goodyear Tire & Rubber Company** . . . two members of the company were honored recently, in recognition of the length of their affiliations with the firm. **F. J. Carter,** vice president in charge of industrial relations, was presented a service emblem commemorating 35 years of service with Goodyear. **A. B. Walter,** chief engineer, Coal Division, of the Belting Sales Department, was honored for 25 years of service. At the same time, Goodyear announced that **C. F. Smith,** veteran chief project engineer for the Belting Sales Department, is retiring to enter the mill supply business.

At **The Yale & Towne Manufacturing Company** . . . with the opening of the new West Coast Material Handling Division plant in San Leandro, California, **John T. McCarley** has been named general manager of the plant. McCarley had been assistant general manager of the company's Philadelphia plant before being named to this new California post.

OFFER ACCEPTED!

Just as the presses were ready to roll, FLOW was informed by the Post Office Department that its offer (see opposite page) was accepted. An appointment has been arranged for FLOW staff members to meet with Mr. Summerfield for a preliminary airing of the problems, with a view towards solution through improved material handling techniques.

At Bendix Aviation Corporation's South Bend plant, foundry sand was lodging in steel belt idlers, causing them to freeze up. Replacing just one steel idler required a two hour shutdown. Frozen idlers sometimes cut through the belt making complete belt replacement necessary.

During a single weekend Bendix replaced *all* the steel idlers with Joy Limberoller idlers. The Joy Limberoller is a single roll idler consisting of pressure-molded neoprene discs on a flexible steel cable which turns on its own axis. Only two bearings are used and these are up out of the dirt zone.

Two years later Bendix reported, *"No Limberollers have been replaced—not one belt has been torn by an idler—inspection and lubrication tours have been discontinued."*

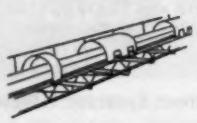
The Limberoller idler works equally well with other difficult materials—coal or chemicals—ores or fertilizers. What's *your* materials-handling problem? For detailed booklet on Limberoller Idlers, write *Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.* In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

WBW L6454-149

Get Bulletin 149-42

JOY...EQUIPMENT FOR ALL INDUSTRY

INDUSTRIAL COMPRESSORS



CONVEYORS

ELECTRICAL CONNECTORS

FANS AND BLOWERS

Circle No. 83 on Reader Service Card for more information

DOMESTIC SERVICE
Check the class of service desired; otherwise this message will be sent as a full rate telegram

FULL RATE TELEGRAM	SERIAL
DAY LETTER	NIGHT LETTER

WESTERN UNION

1911

INTERNATIONAL SERVICE
Check the class of service desired; otherwise this message will be sent at the full rate

FULL RATE	LETTER TELEGRAM
VICTORY LETTER	SHIP RADIOGRAM

W. P. MARSHALL, PRESIDENT

NO. WDS.-CL. OF SVC.	PD. OR COLL.	CASH NO.	CHARGE TO THE ACCOUNT OF	TIME FILED

Send the following message, subject to the terms on back hereof, which are hereby agreed to

April 16, 1957

HON. ARTHUR E. SUMMERFIELD
POSTMASTER GENERAL
POST OFFICE DEPARTMENT
WASHINGTON, D. C.

THROUGH APPLICATIONS OF THE LATEST MATERIAL HANDLING TECHNIQUES, EFFICIENCIES IN INDUSTRIAL AND PACKAGING ACTIVITIES HAVE BEEN RAISED AS MUCH AS 80%. WE BELIEVE THAT APPLICATION OF THESE TECHNIQUES CAN PRODUCE SIMILAR RESULTS FOR THE POST OFFICE DEPARTMENT. THE STAFF OF FLOW MAGAZINE, THE MOST EXPERIENCED GROUP OF SPECIALISTS IN MATERIAL HANDLING AND PACKAGING PROCEDURES IN THE NATION, WOULD BE HONORED TO ASSIST YOUR DEPARTMENT TO SOLVE THIS MOST IMPORTANT PHASE OF YOUR WORK. WE WILL SERVE IN ANY CAPACITY YOU MIGHT DESIRE ON A PURELY VOLUNTARY BASIS.

BERNARD GORDON, JR., PUBLISHING DIRECTOR
FLOW MAGAZINE
CAXTON BUILDING
CLEVELAND, OHIO

WHY we sent this telegram:

On April 16, FLOW sent the above wire to the Postmaster General, in Washington. Its purpose was to call attention to the importance of material handling as a main avenue to cost reduction.

A basic reason for the growth and contribution of material handling as a potent industrial entity has been its acceptance by business management as an essential requirement for the lowering of costs . . . and hence of increased profits.

In again pointing this out to the Post Office Department, FLOW has two interests. First, we believe we have materially added to the progress of the material handling industry by providing the first vehicle for the intercommunication of ideas and information on this burgeoning industrial science. So, we feel that, as one of the spokesmen for our industry, it is within our province to bring our thoughts to the attention of the Postmaster General. Second, as a magazine we depend upon the facilities of the Post Office to continue our role as the communication medium for our industry.

We know that sincere efforts have been made by individuals in our industry, as well as by the Post Office Department, to help obtain greater efficiency in the mail service. Progress has been made, but there is still a long way to go. We believe that past suggestions, as well as those which might be made in light of current developments, should be presented for revue by competent postal authorities.

If any of the people in our industry would like to join us in suggesting to General Summerfield that increased efficiency could develop from a *professional* appraisal and study of the Post Office handling problems, we would be happy to have you join us.

In fact, we would appreciate your advice and opinions about this or any further action our industry might take to benefit the postal service.

Ed Leighton
Editor

Spring Maker Saves 75% of Storage Space with

COMPARISON PHOTOS show how 75% saving in floor space is achieved. At left is the Mather operation before Republic Bar Carriers. Materials were difficult to reach and handle. Inventory control expensive and difficult. Photo above shows neat rows of Republic Bar Carriers. The same amount of material is stacked in one-fourth the space. Length, width and height of carriers can be designed to meet your requirements for handling materials characterized by narrow dimensions.

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

Republic Bar Carriers

GAINS AREA FOR PRODUCTION EQUIPMENT; IMPROVES INVENTORY CONTROL

When a manufacturer is able to reduce storage space requirements by 75%, there is sure to be an interesting story behind it. This one is still unfolding at the Toledo, Ohio, plant of Mather Spring Company, nationally known manufacturer of automotive springs and torsion bars.

Mather was faced with two major problems: (1) Lack of storage space for "in process" springs and materials; (2) Necessity for actually gaining floor space as production increases, to permit installation of new additional equipment.

Republic Materials Handling Engineers were contacted and in cooperation with Mather engineers made a thorough study of material flow, handling, and storage procedure. This study resulted in the design and fabrication by Republic's Pressed Steel Division of a modified version of the standard Republic P-135 Bar Carrier.

Equipped with tiering lugs and channel runners designed for four-way entry by fork-lift truck, the carriers are replacing a four-wheeled unit that Mather has been using. These older units cannot be tiered and consume valuable floor space. Frequent and expensive handling is required to reach desired material. Inventory control has been difficult.

Installation of Republic Bar Carriers has resulted in a 75% saving in floor space, according to Mather engineers. The space gained will be used for installation of new production equipment. And with materials tiered in neat, orderly rows, Mather is able to maintain a close and accurate check on inventory.

Mather will also enjoy future savings, in reduced handling and maintenance costs. Corrugated-steel construction of the bar carriers provides strength, assures long service life at lowest per-year-cost.

Need more space in your operation? A standard unit from Republic's broad line of materials handling equipment may provide the answer. Or you may require the design of a completely new unit. Either way, our engineers will help you. Contact your Republic materials handling representative. Or send us the coupon. There's no obligation.

IMPROVE HANDLING of heavy and hard-to-manage materials with Republic Chain Slings. The basket-chain sling shown above is but one of many types available from Republic's Bolt and Chain Division. They are made to your requirements in alloy steel, high test steel or wrought iron. Fittings and accessories are given the same precision processing as the chain itself, assuring uniformity of the total assembly in strength and material. Because each type of sling has a specific use, we recommend talking over your requirements with a Republic chain engineer. Send coupon for more facts.

GAIN STRENGTH AND SPACE for storing of heavy dies, tools, parts, etc., with Republic Wedge-Lock Steel Shelving. It provides maximum loading in minimum floor space. Wedge-Lock Steel Shelving is specifically designed for high stacking of enormous weights. Joints get tighter and stronger as more weight is applied. Yet it is completely flexible to meet changing space requirements. Wedge-Lock Steel Shelving, a product of Republic's Berger Division, assembles quickly and easily. The coupon will bring you more facts.

REPUBLIC STEEL CORPORATION
Dept. C-3846
3196 East 45th Street
Cleveland 27, Ohio

☐ Send more information on Materials Handling Equipment;
☐ Have a Materials Handling Engineer call.
Send additional information on:
☐ Chain Slings ☐ Wedge-Lock Steel Shelving

Name_____ Title_____
Company_____
Address_____
City_____ Zone____ State_____

STEEL
and Steel Products

Circle 129 on Reader Service Card for more information

(Advertisement)

TIPS ON TRUCKS

Electric trucks cost less to own and run

It's a fact! Compared to your gas-powered types, electric trucks cost far less to own and run.

From the standpoint of maintenance and depreciation alone, you can see all sorts of facts, figures, records, and surveys to support the relative economy of your battery-powered electric truck.

This same pattern of savings applies to your everyday operation—your daily power costs—using electrics. To run a gas-powered truck takes gasoline and oil. To run an electric truck takes current from the battery.

The cost of gasoline and electric current varies from state to state. In addition, some gasoline trucks use more fuel than others, and different drivers will have different costs on the same truck; so the cost of operating a gasoline truck varies, but is much higher. This can be seen at a glance if it is remembered that an electric truck uses no oil. Its maintenance is less because it has less moving parts. All in all, it adds up to the fact that electric trucks cost only a fraction of that required to operate gasoline trucks.

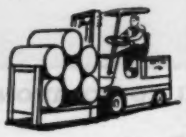
The right type battery provides extra economies

But just "going electric" isn't enough. To get the most out of your electric trucks, it pays to look to your power package, too. C & D *Slyver-Clad* batteries are designed and engineered to give you the most . . . so you can get the most . . . out of your trucks. Here's a minimum 10 percent greater capacity in the standard size tray . . . plus advanced construction features that give extra-long life. It will pay you to check.

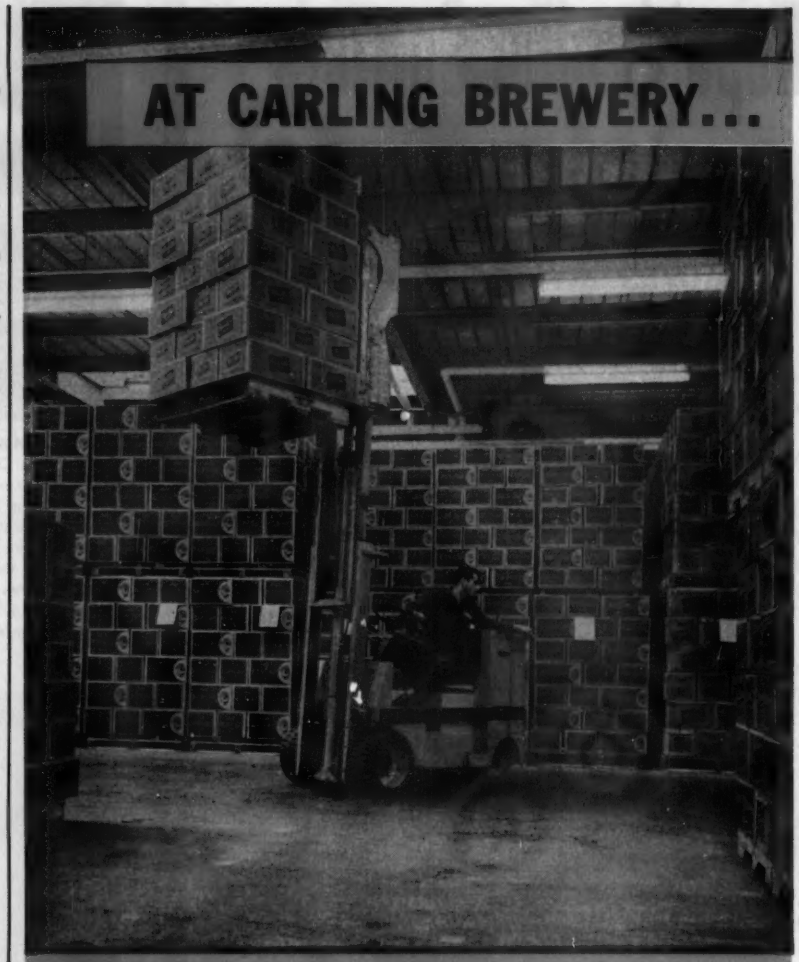
(*Send for the literature offered in the advertisement at right.*)

Match best with best

. . . the best in trucks—*electric*



. . . with the best in batteries—C&D



Warehouse at modern, 600,000 barrel Carling Brewery, Natick, Mass.

'Beer trucks' travel 20 miles; keep modern warehouse clean and quiet

Trucks all electric . . . batteries by C&D

Efficient, economical *materials handling* is just one more outstanding feature marking the new Natick, Mass., Carling Brewery as one of the most modern of its size in the world.

Modern C & D *Slyver-Clad*® batteries power Carling's fleet of 15 electric trucks as they work this spacious 150,000 square foot warehouse. The trucks lug loads ranging from 600 to 2000 pounds over a 20-mile run. Each truck is equipped with two batteries; one on charge, the other operating. Changing batteries at the end of a shift is a one-man operation.

"We purchased battery-operated fork lifts because they are *clean* and *quiet*," Carling states. And with extra-capacity C & D *Slyver-Clad* batteries aboard, extra power with extra economy is the order of the day . . . every day.

It's easy to see why C&D's a better battery buy!

See how you can get more work—through more battery—from all your electric trucks.

Write for Bulletin IT-524.

C&D

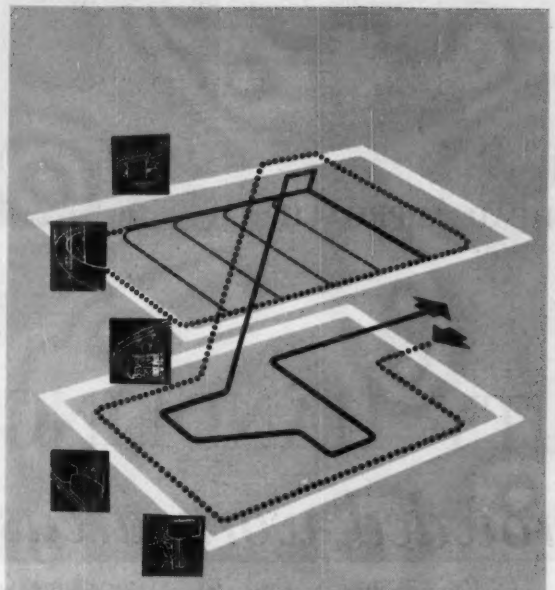
BATTERIES, INC.

of Conshohocken, Pa.

SINCE 1906

Sales and Service Offices in Principal Cities from Coast to Coast

Circle No. 30 on Reader Service Card for more information



MODERNIZED HANDLING...

Tonic for a Lagging Industry

The textile industry was lagging behind more progressive industries a few years ago, but mechanized material handling did much to produce a vigorous revival. The industry has developed many fine handling techniques of its own for its many special products and processes.

By STANLEY S. GREENE
Managing Editor, FLOW

LOOKING for good handling ideas? Some of the most successful handling techniques employed anywhere today can be found in the fast-growing textile industry. They're worth studying if you want to move materials through high-speed, continuous operations. Or move them intermittently. Or handle a wide variety of materials. Or transfer materials between floor levels or adjoining buildings.

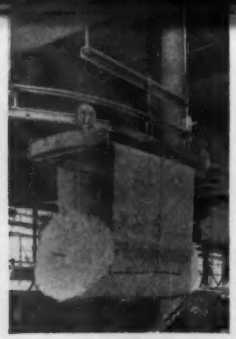
This wide range of problems is common to most textile manufacturers. The rising magnitude of the industry is no more impressive than its growing range of products and processes. The design of mills, and of the industry itself, is changing—but the one constant, indispensible factor is the rapid, dependable, smooth flow of materials.

In the evolution of textile plants, one functional change is from the substantial, traditional brick building four and five stories high, covering large areas, to one-floor plants for more specialized operations. In any such change in design, the movement of materials is a governing consideration.

This very factor may account for the shift of the industry to the South, where building sites are more readily available and less costly. In fact, the 70 percent of the textile output which was once firmly entrenched in New England is now in the South. Furthermore, new ideas were found in building the new mills.

On the other hand, many growing manufacturers decided to keep pace with their competitors by modernizing existing facilities. These decisions presented handling problems of a different nature—such as interfloor handling, handling between buildings, over closely-spaced machines—with the same objective of swift, efficient handling.

On the pages following are a number of excellent handling systems developed in textile plants. Look them over—you may be able to use some of their ideas in your operation, no matter what it may be.



TEXTILES

PART I: THE OVERHEAD APPROACH

12 IDEAS

HEAVY-DUTY HANDLING
over crowded work areas

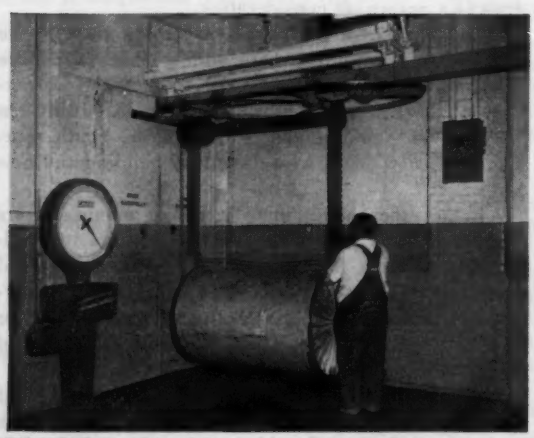
INTERMITTENT moves? Over long distances? With heavy, bulky loads? In crowded work areas?

These conditions prevail in many textile mills and, in the majority of cases, have been met successfully with overhead equipment—monorails or cranes. Heavy loads, such as beams and rolls, can be moved over compactly arranged machinery without requiring excessive aisle space. And, with the application of motorized units, manual labor is reduced to a minimum. Furthermore, floor wear and damage to material is minimized.

In weave sheds, the monorail, or underslung crane (which can be interlocked at crossover tracks), is ideal for transferring heavy rolls over closely-packed looms. Cloth can move from loom alleys to interlocking tracks leading directly to shipping areas without transferring the roll from the original pick-up.

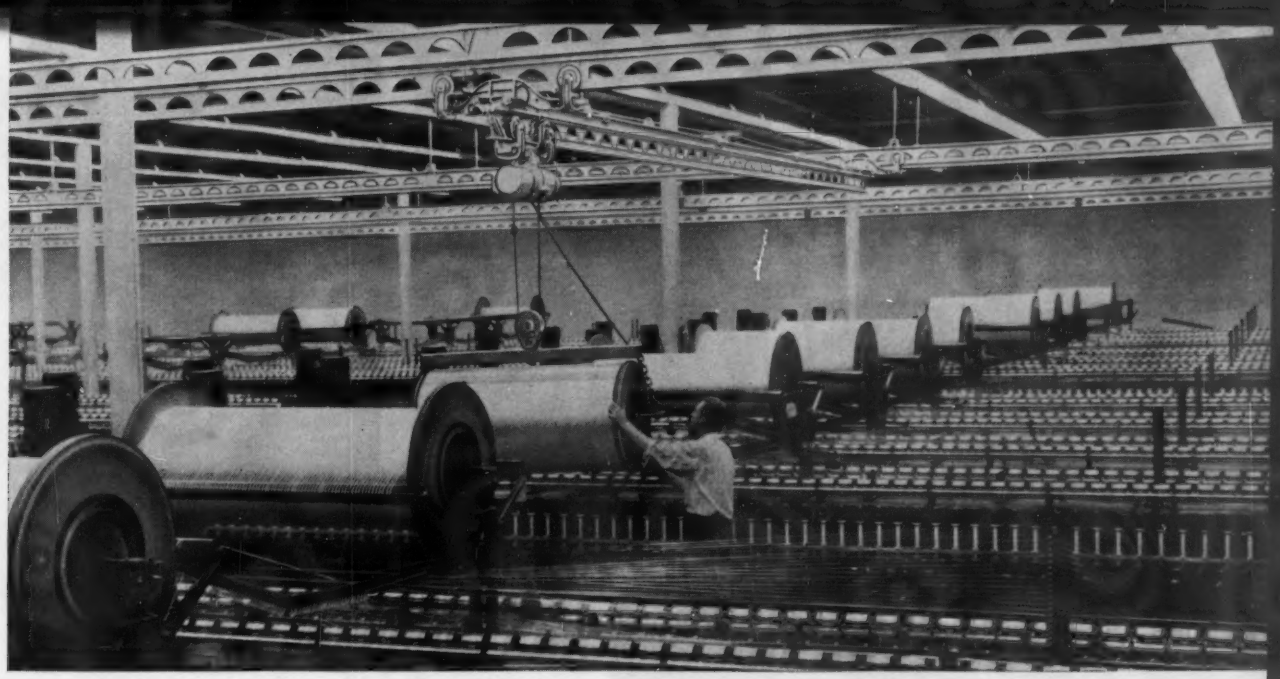
The creeling of large beams on twisters also presents a lifting and carrying problem easily solved by the monorail crane. Movement from storage racks and over long lines of twisters is quickly accomplished without interference to operations. In the dye house, power operation of all movement assures careful and accurate spotting of bulky and cumbersome loads to prevent damage to costly equipment or stock in process.

The monorail hoist can even open doors itself when traveling from one room to another. In one installation where this is done, a monorail system with a twin hook hoist is used to convey heavy section beams from warpers to slashers. An elliptical guard around the hoist trolley functions as an opener for spring action, bi-parting doors. In this particular installation, the beams are weighed en route.



ELLIPTICAL GUARD around hoist trolley on monorail opens doors. The scale weighs beams en route.

MONORAIL STACKER crane with tilting forks is used to handle rolls and boxed carpeting in warehouse.



HAND-PROPELLED transfer crane with electric hoist handles heavy beams of rayon tire cord to twisting machines with creels on top. It transports the beams directly from storage to twisters without rehandling.

Sometimes the modernization of older mills necessitates the transfer of material between floor levels and adjoining buildings. While elevators generally take care of the inter-floor handling, monorails may be suspended outside between buildings to eliminate long distance travel of trucks. Or, as in the case of one mill, filling bobbins were moved over the roof from spinning to weaving by automatic dispatch carrier—with a substantial reduction in handling costs.

Another mill solved the problem of transporting tons of cloth daily between three separate buildings with a similar automatic dispatch system. A weatherproof car in almost continuous operation can be raised and lowered for loading and discharging materials. Destinations are preset and movement is speedy, trouble-free and automatic.

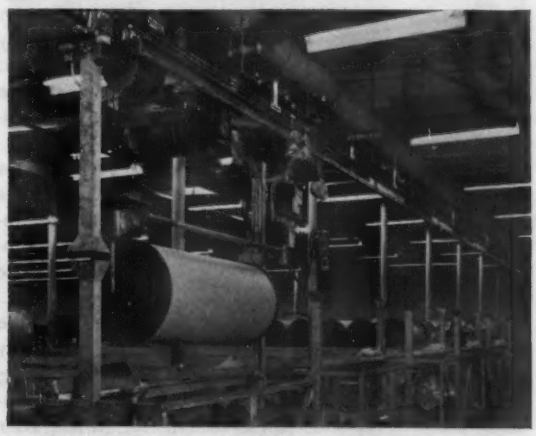
Here's how it works: An operator loads the carrier with two 650-pound beams of domestic print cloth prior to transport from loom room to sales room. He raises the carrier into position and selects its destination by push button. From that point on, the movement of the carrier is automatic as it stops at the desired destination and completes its trip unattended between buildings.

A problem common to textile mills is the transfer of small rolls of cotton known as silver laps from the lapper machines to the combers, with the subsequent return of the empty lap cores. One manufacturer installed a loop of monorail track to serve all machines in this operation.

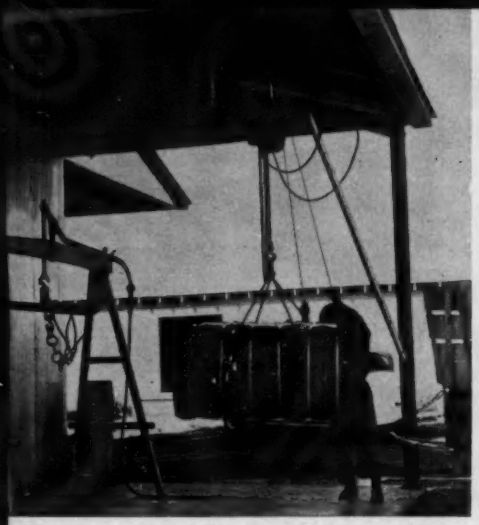
Special monorail carriers with three-tier racks are loaded at the lappers while carriers are on the loading tracks inside the large end of the monorail loop. They

(More on next page)

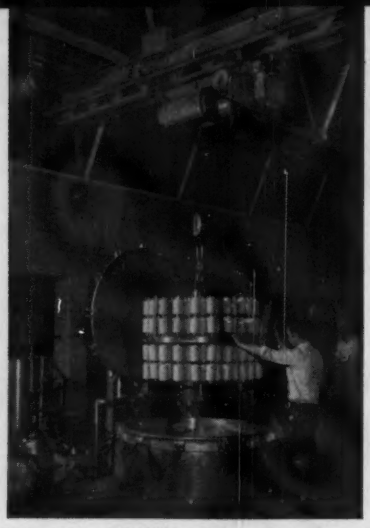
MOTORIZED transfer crane permits direct delivery from storage to dyeing, and increases storage by 50%.



AUTOMATICALLY dispatched hoist lowers beam to top tier of storage rack, then returns for another load.



JIB CRANE with electric hoist unloads bales on dock.



SPECIAL RACKS with mandrels of yarn are placed in large dyeing vats.

GRAB, monorail, team up to move packaged carpeting into a trailer.

are then pushed through the track switch onto the outside loop. When the track switch is closed, a powered trolley which stops automatically ahead of the switch is energized. It pushes the carrier, or train of carriers, to the comber machines.

A similar problem in another mill was the transfer of laps from eight pickers to 236 cards. The solution was an automatic dispatch monorail system which operates automatically from picker tender to cards.

Laps are placed on special carriers and roll by gravity around to an escapement device where they roll one at a time on a monorail scale section. There the weight is recorded and, if within tolerance, the carrier passes onto a lift section. It is then raised to the card room level and rolls through an opening to a train assembly track in back of the cards.

If the weight of a lap is below or above tolerance, a signal light is set and a whistle blows, warning the picker tender to check and adjust the picker to prevent further bad laps. Rejected laps also are raised to the upper track level, but roll through a reject switch around the track loop in the picker room for rework through pickers.

When a train of 20 carriers has been made up on the assembly track, a powered trolley automatically starts to move around the long loops in the card room. An automatic electric block system across the middle of each long run of track holds trains an equal distance apart to prevent over-travel.

At the card racks—which are specially built for this automatic delivery system—the receiving tray raises when the lap is removed, placing it in position to receive a lap from a carrier. This occurs when the tripping device on the carrier registers against the baffle on the receiving tray.

When a train has completed its trip through the card room and reaches the reject switch, the empty carriers roll through the wall opening to the loading track loop in the picker room. If a carrier still contains a lap, it registers in the electric eye which, after an interval for clearance of empties, throws the track switch. This allows travel of the full carriers and powered trolley to the asesmbly area where they are automatically held until a full train is assembled.

Another handling problem prevalent in the textile industry is the movement of bobbin boxes. Before mechanization, they were handled manually, generally two at a time. Each worker would ordinarily pull one and push the other, adding to congestion in narrow aisles and tying up elevators when inter-floor movement was required.

Wasteful Handling Eliminated

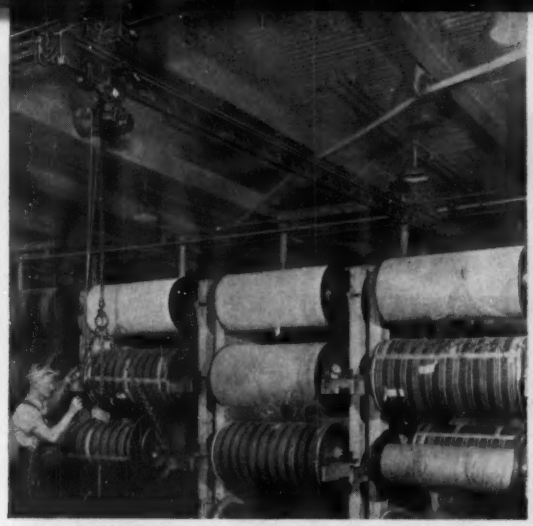
An automatic dispatch monorail system similar to those described previously eliminates this wasteful manual handling. One typical sytem carries 60 bobbin boxes each 8-hour shift from spinning rooms on three separate floors in one plant to a distribution point in a loom room on the third floor of an adjoining plant.

Essentially, the equipment consists of a powered carrier operating between two towers mounted outside each building. The carrier includes a twin-hook electric hoist supporting an enclosed car into which three bobbin boxes are rolled. The boxes weigh 400 to 450 pounds each when full.

Let's assume the carrier is returning from the loom room with empty boxes. It travels across the roof of the spinning department building at 150 feet per minute, slowing down to 50 feet per minute at the track curves. It comes to a complete stop immediately ahead of the tower for a slow approach to assure accurate spotting of the guide rollers within the tower frame.

When the carrier stops, the hoist lowers the car a short distance before coming to rest. At the same time, green signal lights are energized at the fire doors on all three floors of the spinning department. Operators on any floor may call the car to a location pressing the "call" button on the push-button control. This puts out the green light on all floors, locks out controls on the other floors and lowers the car to the proper floor.

The car stops within 6 inches of floor level and lights an amber bulb. The operator then lowers the



TEXTILE BEAMS can be stored efficiently with hand-propelled monorail and hoist. Requires only one man.

car with the "down" button until a red bulb lights to indicate floor alignment. If he over-runs, the amber bulb relights so that he must use the "up" button to align the car. A motor-operated roll-type fire door inside the building is then opened by another push-button. This also cuts off all power to the carrier, as well as to the other fire doors in the spinning department.

Should operators on two floors press "call" buttons simultaneously, the car will lower to the nearest one.

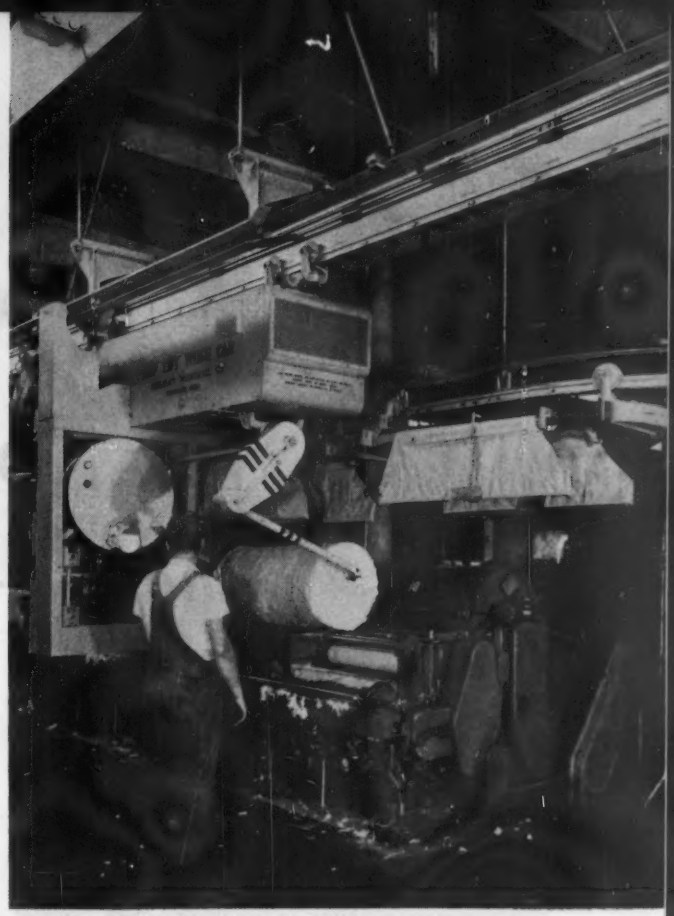
After fire doors close in the spinning room and "run" button is depressed, a loaded car is dispatched to the weave room. The car raises to its upper limit on the carrier, which then travels to the opposite tower. In stopping, it follows the same procedure described previously.

Up to this point, we've limited our discussion to overhead systems of the monorail type. However, the overhead traveling bridge crane also plays an important role in textile plants—from handling various materials through processing operations to the storage of finished goods.

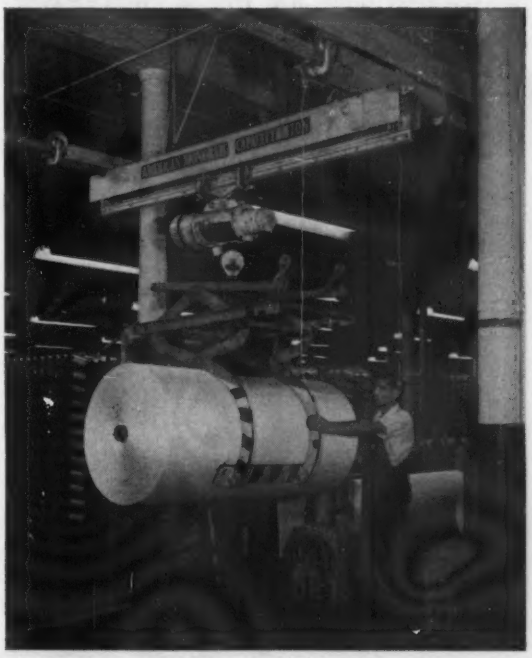
One such overhead crane system has effected highly-improved handling of yarn in the dyeing department of a southern textile mill. Yarn is delivered at the dyeing department on specially-fabricated racks. It is then transferred by the overhead crane onto mandrels and placed in large vats for dyeing under pressure. When completed, the colored yarn is removed from the vats (also by overhead crane) and moved to other departments for processing into actual cloth.

This system permits virtually uninterrupted dyeing. By the time the last mandrel of yarn has been placed in its vat, the first is ready to be removed. Furthermore, the department is efficient and uncluttered, aisles are wide and unobstructed, offering ample and safe working space.

To handle large rolls and boxed carpeting into and out of storage, a stacker crane may be incorporated into the overhead system. This type crane is equipped with forks for raising and lowering loads, and can service each side of aisles.



SPECIAL CAR picks up laps at picker for transfer to canvas sling. It checks all laps for the correct weight.



MONORAIL CRANE equipped with grab removes rolls of cloth weighing 1300 pounds each from looms.

TEXTILES

PART II: UTILIZING INDUSTRIAL TRUCKS

19 IDEAS

IN-AND-OUT FLOW

of hard-to-handle shapes

UNLOADING boxcars of awkward, bulky materials? Moving unwieldy loads into and out of storage? Shipping hard-to-handle shapes?

If your plant has problems of this nature, you probably can solve them the way the textile industry has—with industrial trucks. The many attachments which have multiplied the fork truck's versatility, its inherent maneuverability, ability to handle and stack loads of a multitude of shapes and sizes—these are some of the features which have made this equipment indispensable to industry.

Let's take a typical textile mill as an example. Actually, this particular mill had two handling problems not involving processing: (1) unloading incoming raw materials and (2) storing, crating and shipping the outgoing finished product. The finished product—rolls of floor covering—averages 18 feet in length and weighs up to 1500 pounds. To handle such odd shapes by hand would be extremely cumbersome and would require a tremendous amount of storage space. Furthermore, manually positioning the carpeting for crating or wrapping in Kraft paper would be time-consuming.

HARD-TO-REMOVE first bales of carload are unloaded, three at a time, with truck and clamping unit.

Now, here's the efficient way: Incoming bales of raw materials are unloaded quickly by fork truck. They are stored in the warehouse in stacks up to 12 feet high, and can be moved easily by the truck to cleaning and drying vats for processing.

Use of Pivoted Fork Bar

Finished rolls of carpeting also are handled by a fork truck, this one being equipped with an ingenious pivoted fork bar. In the crating and packaging department, the truck lifts the long rolls of carpeting onto small dollies for crating or wrapping. Then, the truck lifts the packaged carpet to carrying position.

The pivoted fork bar swings the roll hydraulically into a horizontal position alongside the operator. Thus, minimum aisle width is required. On a tight corner, the driver can maneuver by adjusting the load swing for clearance.

Storage is simplified with large storage racks mounted on rollers. These racks are loaded and unloaded by fork truck. When filling an order, the appropriate rack is pulled out and the truck with the pivoted fork bar removes the carpeting desired. The rack is then pushed back out of the way. Operating on an intermittent basis only, the truck handles approximately 15,000 pounds of carpeting a day.

At another installation—a cotton warehouse—a fork truck equipped with a clamp attachment unloads freight cars of cotton bales. Two bales are removed at a time. One truck can unload a typical load of

CLAMP-EQUIPPED diesel-powered fork truck brings bales of cotton to weighing machine in this warehouse.

110 bales and block them up on the receiving dock in about 45 minutes. To do the same job manually would take between seven and eight manhours.

In the warehouse itself, another truck moves six bales at a time. By using fork trucks equipped with bale clamps, 127 bales of cotton are sampled and weighed in just ten manhours. Compare this with the 23 manhours per 100 bales formerly required with manual handling.

After sampling, bales are picked up two at a time and deposited on scales for weighing. Then, after they are weighed, the bales are picked up by another truck with bale clamp at the other side of the scales and delivered to a designated blocking-up area. They are upended in transit for vertical storage.

Incidentally, removal of the first bale from a tightly-packed freight car is anything but easy. Many plants use a specially-designed breakout attachment on a truck for just this purpose—it literally spears a bale, front and top, for removal. However, the bale clamp itself is being used successfully for this particular operation.

Inside the textile mill itself, fork trucks are taking over many jobs formerly done with time-consuming manual methods. For example, cotton textile mills are using trucks equipped with remote control. In one such application, cones of yarn are placed in boxes after leaving the coning machine. The cones must then be stored in 8-foot-high bins which extend to the ceiling.

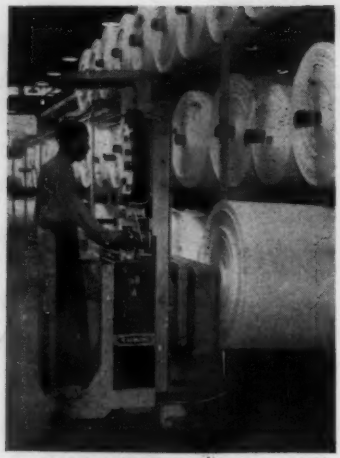
To do this, the boxes of cones are carried to the storage area by the truck. Using the remote control, the truck operator lifts himself and the box of cones to the proper height. He then places cones in appropriate storage bins, according to the color of the yarn. This same technique may be used to place bolts of finished cloth in proper storage bins.

Another example of effective in-plant use of fork trucks shows these results: car unloading cost reduced

(More on next page)

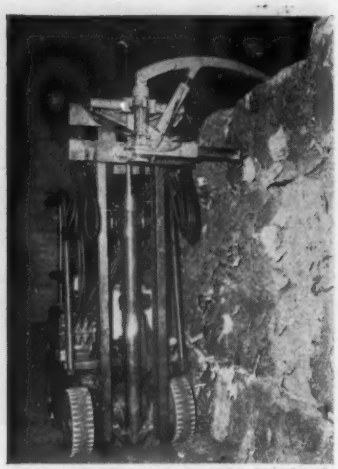
COLLAPSIBLE wire containers filled with tubes of yarn are picked up three at a time, stacked five high.

PORTABLE BINS designed with pallet bottoms hold spools of yarn, can be stacked and removed as needed.



CHROME-PLATED rams are adjustable for different-sized rolls.

INCOMING BALES of nylon are stacked by using the forks only.



BREAK-OUT device is hydraulically actuated and "spears" the bale.

66 percent, storage capacity doubled and plant-wide handling costs cut in half. These savings were realized by a large carpet manufacturer. Here's how:

Kraft cord used in this company's operation arrives in palletized packages, and is stored by fork truck into a stockpile from which beamers are loaded. Bales of wool also are unloaded and stored by fork truck. However, the wool is not palletized. Forks are simply inserted under the bales—usually two at a time—and they are stacked in the storage area. A hydraulically-actuated pusher device pushes bales off the forks. Saved: time and space.

Further savings were achieved in supplying the weaving department with spools of yarn. Yarn used by the company to make carpets is kept in portable bins, each holding 288 spools. The bins are moved to the working department as required. Placing pallet bases on the bins made it possible not only to stack them in storage, but to transport them by fork truck to the weaving department.

As a matter of fact, as many as seven bins can be moved at a time. One bin is carried on the truck's forks. Six others are placed on dollies and towed by the truck in a train.

Which brings us to the use of the tractor-trailer train in textile plants. By installing such a system, one cotton mill was able to reduce its handling costs 37 percent despite an increase of 60 percent in daily operating time.

Of course, not every plant can utilize this type of equipment. As with any installation, a number of variable factors must be considered before final selection of the handling system is made. The cotton mill mentioned here made a thorough study of the labor and equipment involved in the flow of materials throughout the plant before it revised its handling methods.

The study revealed that all trucking was being done manually, and that the distance covered by truckers was more than 65 miles per 10-hour day. The number of hand trucks needed for the heavy volume of traffic often caused congestion in the plant. Furthermore, shortages of trucks occurred frequently because they were used interchangeably between departments.

No single authority was in charge of the general intra-mill transportation. Each department had its own truckers who were sent where, when and as needed to deliver and pick up all items. In short, the company simply had outgrown that area in which hand trucking is the most efficient method of handling.

So, the company revised its handling. This consisted principally of acquisition of two tractors and 64 special trailers, plus alterations to the plant to permit easy maneuverability of the tractor-trailer train.

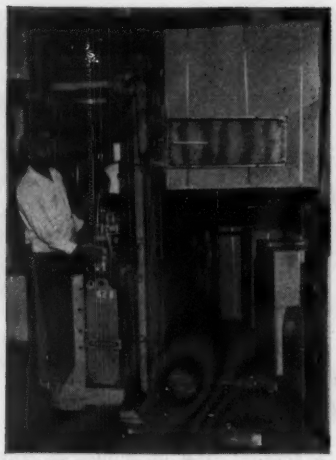
Two Tractors Serve Four Levels

To help develop the new handling system, flow diagrams were prepared to show production for each department, routings for each item transported and the personnel involved in material handling. The proposed system had one tractor serving two levels connected by a ramp and another tractor for two other levels which were connected by elevators. The elevators were to be used as dispersing stations.

Each department was allocated a number of trailers according to its needs. These permanently-assigned trailers, marked to indicate departmental origin and destinations, were to be hauled between elevator dispersing stations. The elevators would then transfer the trailers between levels and leave them in appropriate parking areas for further hauling by the tractor assigned to that level.

Because of lack of uniformity between building levels in the mill, alterations were necessary to tailor the plant to tractor-trailer trains. One of the newer elevators was reinforced to permit inter-level movement of the tractors. Throughout the plant, aisles were too narrow and space around elevator exits was limited. In some instances, flooring had to be reinforced, old doors widened and new doorways installed.

To point out the diversity of items handled by the



NARROW-AISLE truck with clamp readies cases for shipment.

REMOTE-CONTROL truck raises operator and goods for storage.

OUTGOING CARTONS of finished goods are loaded into car.

tractor-trailers, they transport these materials between departments: roving bobbins, warp-spinning and filling bobbins, twister bobbins, spooler cheeses, binder cones and tubes, dye springs, section beams, loom beams, waste material and cloth in folds, rolls and bales.

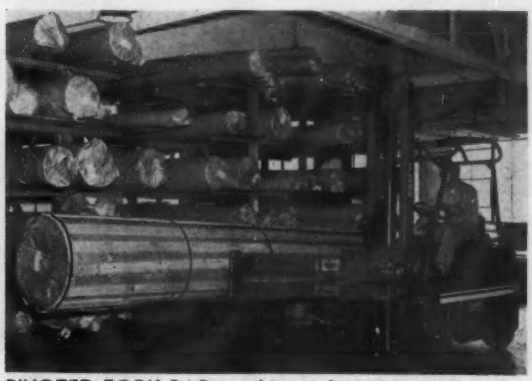
Accordingly, the trailers were individually designed for maximum effectiveness according to the special needs of this particular mill. Large box-type trailers with loads of spinning bobbins are electrically dumped at conditioning machines. A special trailer was designed to handle two loom beams loaded directly from the warper. And, trailers with ramps which can hold two box trucks containing twister bobbins also are used.

Not only are trailers designed for special duty in textile plants, but trucks themselves are developed to handle specific items. One such special unit is an electrically-powered filler yarn truck, essentially a walkie-

(More on next page)

"UNIVERSAL" clamp on this truck can be used to handle pallets, skids, bins or, as shown here, bales.

FORK TRUCK being used as tractor carries bin load of spools of yarn on forks, tows six others on dollies.



PIVOTED FORK BAR on this truck enables it to move long rolls in aisles only 3 feet wider than the truck.

STRADDLE CARRIER picks up and moves 15 bales to port.

STEEL RAM, 12 feet long, enables truck to stack large rolls of jute.

TRACTOR-TRAILER train hauls various type loads through mill.

type truck. However, it is equipped with dual controls located in separate handles at either end. The truck body consists of shelves and compartments.

Shelves of the truck are loaded with boxes of quills of filler yarns. The operator guides the truck down the warp alley between looms, filling each loom that requires additional quills. Incidentially, this filler yarn is weaved cross-wise between warp, or lengthwise, threads to form a pattern or design. Thus selecting the proper color and yarn for the loom is highly specialized work, and each truck operator must be an authority on the operation. And, placing yarn in the correct locations in the battery, which automatically feeds a shuttle in the loom, requires equally extensive training.

The shuttle constantly varies its demand for yarn types and colors. Yarn automatically drops from the battery to the shuttle, and an error in placement obviously would be costly. Using the filler yarn truck, an operator can easily service at least 100 looms. Since he doesn't have to push or pull the truck, his work is faster and less fatiguing.

The truck also may be used to service looms weaving single-color fabrics. In this case, the operator simply would have to keep the batteries of his looms filled, without precise yarn selection and replacement. Controls for the truck are the same as those for standard walkie-type trucks, except there are no provisions for raising and lowering.

We now come to another type of industrial truck which has found its way into the textile industry—the straddle carrier. Naturally, this type of equipment is ideal for outdoor operations, such as those conducted by a typical cotton warehouse in Texas. Here, cotton is stored, compressed and shipped.

Briefly, here's the movement of cotton through the compress: individual bales are weighed and tagged on arrival and then placed in storage. The number and location of each bale is recorded on control records in the office. When ordered for shipment, they are moved to the press room, checked, run through a "dinkey" press to remove bands and then compressed either to standard or high density, depending upon whether shipment is domestic or export.

After the bales are compressed, they are marked and either loaded into boxcars for domestic shipment or transported approximately 2½ miles to the dock for overseas shipment. It is for this move to the dock that the straddle carriers have more than proved their value.

The company owns four of these carriers. Each has a capacity of 10,000 pounds and is equipped with special load hooks. Loads consist of 15 bales each, placed on wooden bolsters. A carrier can make the trip to the dock and return in about 15 minutes. While a carrier is delivering one load, the next one is being made up to eliminate idle time.

INCOMING loads of kraft cord are palletized for stacking.

OUTGOING bales of cotton are loaded quickly, easily by truck.

PUSHER attachment permits bales to be stacked without pallets.

TEXTILES

18 IDEAS

PART III: CONVEYORS MAKE THEIR MOVE

UNINTERRUPTED MOVEMENT
through high-volume production

UNINTERRUPTED movement? High-volume production? Automatic control, routing and dispatching? Multiple operations?

An installation with these movement factors generally finds conveyorization the only solution to its problems. Strangely enough, the textile industry has been compartively slow to conveyorize. Only recently has it applied high-speed handling to its high-speed production—but other industries can well benefit from some of the effective techniques now being applied in conveyorized textile mills.

These mills do not restrict their use of conveyors to any one particular type. All types are widely used—from pneumaitcs to overhead and belt to gravity rollers used in live storage systems. And, the materials handled range from cotton tufts to finished, packaged goods.

Let's examine the methods used by a garment manufacturer to fill orders involving hundreds of different garment types and 27 special box sizes. To complicate matters even more, there were differences in package sealing methods and shipping media. And, the entire volume had to be handled in one unified, non-interrupted operation.

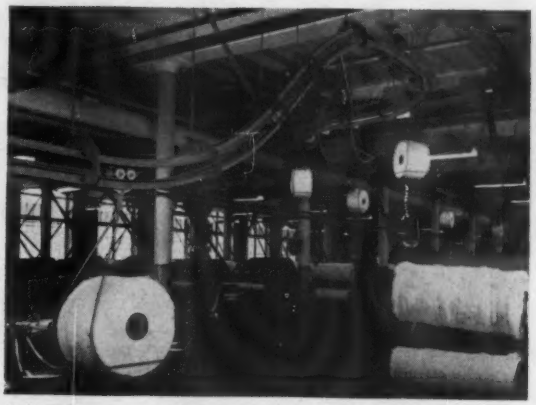
Here's how it's done:

Orders arrive via vacuum tube in a third floor storage section. They are sorted and distributed to five order filling sections by wire basket. To fill orders, stock is picked from shelves and placed in crate-type, three-sided boxes which move on dual, side-by-side conveyor lines.

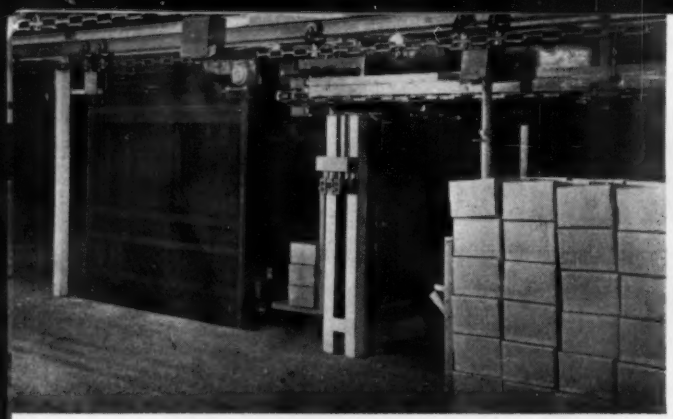
The inside conveyor of this dual line is gravity roller and permits stationing of order boxes as orders are filled. Parallel to the roller conveyor is a power belt conveyor which is used almost exclusively for taking away completed orders. When an order is completed, it is transferred from the roller line to the belt and taken to the order checking station. Thus, there is

(More on next page)

SPECIAL CARRIERS on overhead trolley conveyor hold loads horizontal, regardless of inclines or dips.



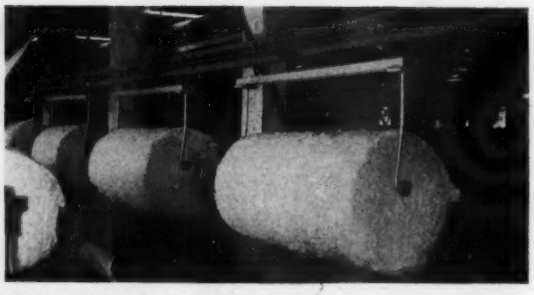
ROLLS on special-type trolley conveyor are carried through mill, around corners, up over machinery.



TOWING CONVEYOR hauls trucks loaded with boxes. Note elevator for transferring between floors.

MULTI-LEVELS can be negotiated with towing conveyor by means of elevator, shown in photo above.

FINISHED TEXTILES also can be handled by overhead conveyor. Carrier hoods afford material protection.



TROLLEY CONVEYOR provides a continuous movement of laps from the picker room to the card room.

no time lost in having completed orders remain in line until orders ahead of them are filled.

Parcel post items are removed from the order-filling boxes, packed in cartons and sent by wheel conveyor to a weighing section. Empty boxes are returned by conveyor to the start of the order picking line. The same procedure applies for freight items. After weighing, parcel post and freight cartons move by conveyor through a case sealing machine and travel on a declining power belt conveyor to the ground floor shipping department, where they are loaded on trucks.

In addition to handling packages of finished goods, conveyors also speed up movement of raw materials between processing machinery. One mill, for example, uses an overhead trolley conveyor to transfer laps from the pickers to the cards. It has reduced labor considerably and helps prevent laps from being damaged by excessive handling. Furthermore, the problem of storing laps has been simplified.

This conveyor, approximately 546 feet long, extends from the picker room to the card room and carries 91 laps. It passes through an opening in the wall and makes a right-angle turn toward the card room. While it moves conitnuously over the card creels, it can be stopped at any point by push-button controls located throughout the card room.

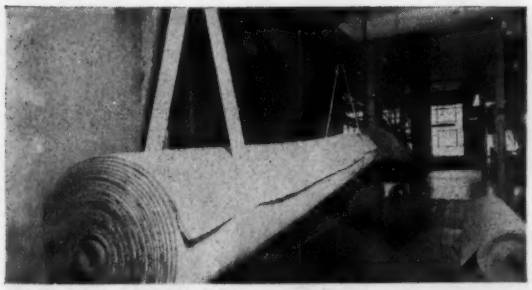
Overhead Conveyor is Adaptable

The overhead trolley conveyor just described is well adapted to textile mill application. It greatly improves material flow and eliminates congestion in card room traffic. And, it can be adapted to handle a number of different types of materials.

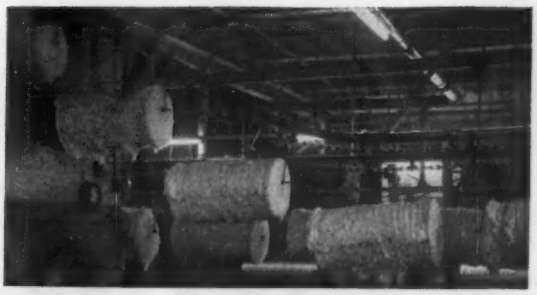
It can, for instance, be used as a tow-line to haul floor trucks through the mill. One such system handles cartons of pillowcases and sheets through an extensive storage and shipping area. The company involved, a manufacturer for large retail outlets, holds substantial quantities of material in storage for immediate shipment to meet the requirements of various buyers.

Thus, a great amount of storage space is needed, and a conveying system of this type makes it possible to get material into storage and out again with minimum confusion. Since storage is on two floor levels, the system includes two hoists to move trucks between the main floor and the mezzanine.

When the trucks are lowered from the mezzanine to



CARPET ROLLS which are up to 15 feet long can be suspended from slings for conveyor movement.



PICKER LAPS are shown leaving picker room, en route to card room, by means of an overhead wall opening.

the main floor, they are loaded automatically onto the shipping conveyor on that level. At the end of the tow-line system, cartons are removed from the shipping conveyor and placed on a gravity line feeding an inclined belt conveyor running to the shipping dock. At the shipping dock, the belt discharges at about the middle of a reversible belt conveyor installed along the outside wall of the building. Then, cartons are deflected into chutes serving eight truck lines. A telescoping roller conveyor is used for special shipping and receiving jobs at the dock.

This integration of different types of conveyors is typical of the effective handling techniques applied by progressive textile plants. Let's take another example. This one also involves the continuous flow of packaged goods from a mill where expansion made it necessary to double the warehouse space.

Packed cases of finished materials are delivered to a second-floor storage area. They travel over a system of gravity and live roller sections to a vertical pendent conveyor which handles 80 cases an hour to keep the plant and shipping department going at full capacity. This vertical conveyor takes cases from the second floor to the first floor and basement. Materials are unloaded on any given floor by push-button control. An electric eye at each unloading station stops carriers to avoid traffic jams if cases are not removed as they are delivered.

From the time the packed cases leave the strapping department to the time they are distributed to any of the three floors of the warehouse, they are completely unattended. All that has to be done is to push the button at the vertical conveyor to select the unloading floor. The cases are then moved from the conveyor and placed on racks.

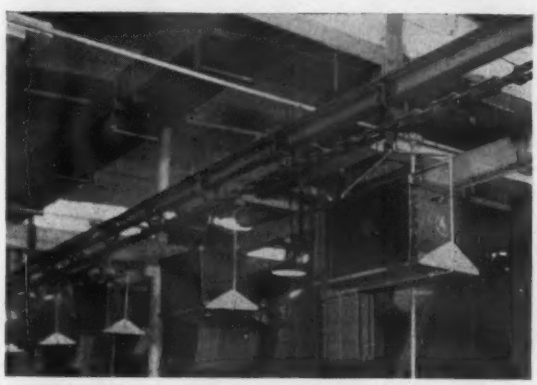
A similar type of vertical conveyor have proved to be a valuable investment for another textile manufacturer. It's a suspended-tray conveyor, six stories high, and has solved the inter-floor handling problem common to many multi-story plants.

This particular unit carries factory box trucks between floors of the plant to reduce manual handling and free elevators for other duties. It also handles large beams of rayon, as well as the trucks.

In operation, box trucks (which might contain any commodity, depending upon what a plant produces)

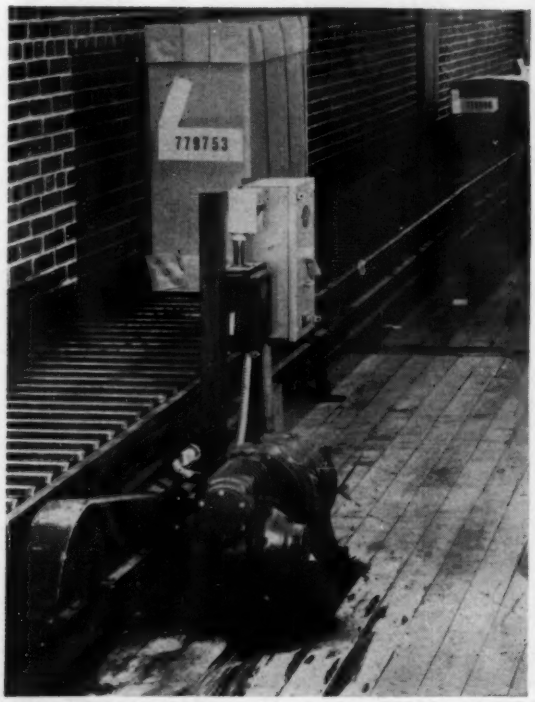
(More on next page)

SPECIAL BELT carriers used with conveyor elevator for multi-story movement of rolls is quick and easy.



BOBBIN BOXES and other containers can be conveyorized, employing carriers which keep them horizontal.

AUTOMATIC DISPATCHING is possible with elevator sections. Operator simply pushes button for floor.



LIVE-ROLLER conveyor moves cases from packaged goods department, start of automatic dispatch system.

LIVE-STORAGE rack is loaded by operator riding special track-mounted elevator. Loads arrive at right.

are pushed into the shaftway on retractable fingers, or shelves. Trays then pick up the trucks, carry them up and over the drive sprockets and down the other side where they are deposited on discharge-floor fingers. The trays are suspended between endless chains, one along each side of the shaftway. Automatic safety devices and interlocks prevent actual operation unless loading and discharge stations are clear.

This type of conveyor also can be tailored to meet specific plant conditions and product requirements. When large quantities of a given item—such as sectional beams—must be handled between floors, it often is economical to provide a conveyor designed specifically to handle that commodity.

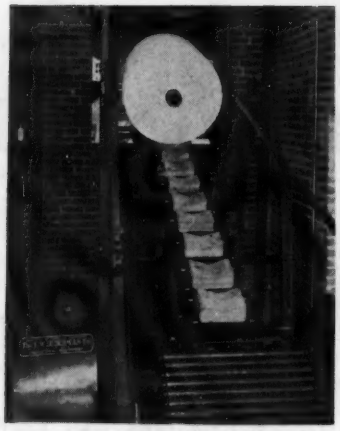
However, inter-floor handling is not the only factor which determines the necessity of a specially-designed conveyors. One mill, for instance, had to move 400-pound rolls of cloth from one building to another. It was a heavy job for a large crew. Tie-ups and delays were frequent, and rolls often were damaged in the long trip along a platform and down a ramp. Obviously, a faster, more efficient method was needed, inasmuch as approximately 1250 rolls were handled every week.

Using Special Conveyors

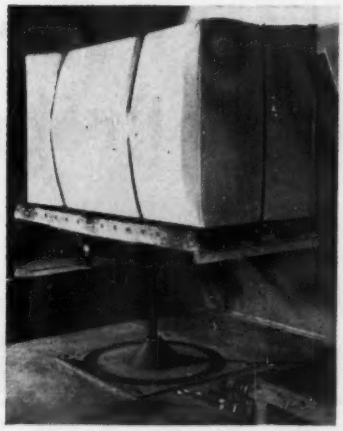
A conveyor manufacturer solved this difficult handling problem by designing a special conveyor. A pallet-type chain conveyor was decided to be the best type to handle the large rolls. However, a special design was required, since the vertical elevation of the conveyor as well as its horizontal direction changed, unusual in the type of conveyor selected.

The single strand of continuous chain, 800 feet long, is equipped with individual four-wheel dollies with V-shaped wooden blocks to hold the rolls in position. At the loading station, the rolls are pushed onto these special dollies. The rolls leave the conveyor at the unloading section, and are placed on rails and moved to storage.

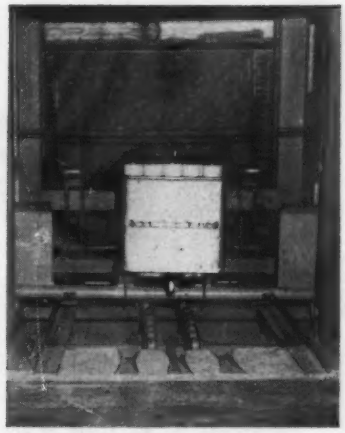
Finally, let's consider use of gravity conveyors in storage racks—commonly referred to as live storage.



CHAIN CONVEYOR with special 4-wheel dollies handles heavy rolls.



ELEVATING SECTION in roller line permits efficient strapping.



"FERRIS-WHEEL" conveyor is six stories high and handles trucks.

One mill uses this type of system for storage of cotton yarn prior to shipment to various thread and fabric mills. It provides an orderly manner of handling where the first box placed into a given lane will be the first one out, since the sections of conveyor on the rack have a slight pitch so that the cartons will always be at the front of the rack. Inventory of any item is always readily available and the materials can be stored with minimum contamination and possible damage.

A special elevating device is installed behind the racks. It travels on tracks and an operator can ride the unit, pick off incoming cartons, travel down to the proper storage lane and place them into storage. Incoming cartons arrive on four lines of roller conveyor, arranged in two decks, parallel to the racks and the path of the traveling elevating device. A similar device located in front of the racks permits quick removal of desired cartons.

By using this type of conveyorized storage, this mill was able to reduce the size of its new warehouse sufficiently to pay for the installation, in addition to the other benefits.

FLOW thanks the following for their help in preparing this report: Allis-Chalmers Manufacturing Company; The Alvey-Ferguson Co.; The American MonoRail Company; Automatic Transportation Company; The Baker-Raulang Company; Barrett-Cravens Company; The E. W. Buschman Company; Clark Equipment Company; The Cleveland Crane & Engineering Co.; Electro-Lift, Inc.; Gifford-Wood Co.; The Hamilton Caster & Mfg. Co.; Heppenstall Company; Jakes Foundry Company; The Lindahl Conveyor Co.; Lewis-Shepard Products, Inc.; Link-Belt Company; The Louden Machinery Company; Mathews Conveyer Company; Mechanical Handling Systems, Inc.; The Mercury Manufacturing Company; Samuel Olson Mfg. Company, Inc.; The Rapids-Standard Company, Inc.; The Raymond Corporation; Standard Conveyor Company; Towmotor Corporation; Jervis B. Webb Company; Whiting Corporation; The Yale & Towne Mfg. Co.

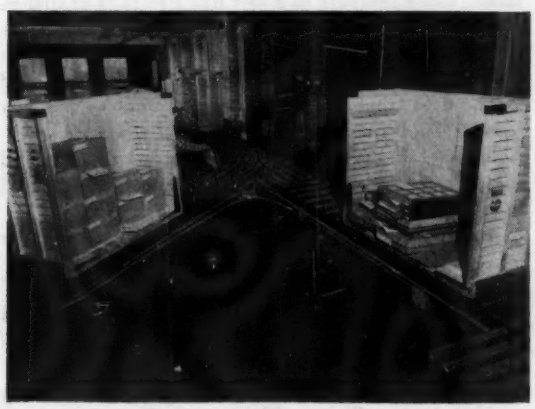


PHOTO-ELECTRIC cell separates freight (left) from parcel post. Open-sided boxes speed up loading.

PACKAGED ORDERS are routed through scales and sent down line. Empty carriers also are conveyorized.

In fork truck operations . . .

Linear Programming Can

To / From	B	C	D	E	Total
A		6	3	1	10
B		1		4	5
C	3		5		8
D	2	4		3	9
E	7		1		8
Total	12	11	9	8	40 / 40

Fig. No. 1: Route Table—Average number of moves (loaded) per day between departments.

From / To	B	C	D	E	Empties Req'd.
A					10
B					5
C					8
D					9
E					8
Empties Avail.	12	11	9	8	40 / 40

Fig. No. 2: Return table

From / To	B	C	D	E	Empties Req'd.
A	-.62	-.37	-.23	-.35	10
B	0	-.75	-.80	-.65	5
C	-.75	0	-.21	-.15	8
D	-.80	-.21	0	-.45	9
E	-.65	-.15	-.45	0	8
Empties Avail.	12	11	9	8	40 / 40

Fig. No. 3: Distribution matrix return table

MATHEMATICAL or linear programming has been receiving rather wide-spread attention of late, particularly as a new means of solving a wide variety of management and business problems.

Often it would appear that this new tool of analysis is the panacea for solving all management's problems, a panacea that should only be used by a highly trained and skilled group of specialists. Actually, mathematical programming is a new and, to be sure, a rather powerful tool with some limitations, that can be added to the industrial engineer's "tool kit" without too much difficulty. Mathematical programming can be most simply defined as the means used to obtain the very best solution to a problem having many possible solutions. Many will dispute this definition as being too simple. However, it does define the essence of mathematical programming.

This article will attempt to show how mathematical programming can be applied to improve a typical non-automated material handling problem. Mathematical programming will be shown more in its true proportions—as a means of obtaining a solution to a part of the total problem.

Non-automated handling as used here will pertain to material handling on skids or pallets or in drums or tubs via fork lift truck or similar means of conveyance. The efficiency of this means of material handling has been estimated at near 40%, although many members of management would argue that this estimate is too high. In terms of effectiveness and efficiency, non-automated handling is now in the same state of development as the average factory job was at the turn of the century. To illustrate—around 1900 the average factory worker reported to his foreman, and his instructions were little more than: "There's your machine, go to work." Today, with the application of industrial engineering, the worker's assignment has been better developed, his instructions are much more detailed, and a measure of a fair day's work is available. By contrast, however, the average fork lift truck driver or material handler's instructions are little more than "There's your truck. Patrol this area of the plant and keep out of trouble." (The latter may not be said but it is probably implied at least). As a result, it is difficult and often outright impossible to develop and measure a fair day's work for people in a material handling assignment.

Actually the greatest single source of inefficiency in non-automated handling is in "dead heading" or moving an empty truck from one location to another. While "dead heading" cannot be eliminated in most cases, it can be minimized with mathematical programming.

Many industries have attempted to lick this handling problem by installing a wide variety of automatic handling devices. The cost of these is, in most cases, justi-

Cut Dead-Heading

By R. W. Metzger
Industrial Engineering Department
General Motors Institute

From \ To	B	C	D	E	Empties Req'd.
A	-.62 ⑦	-.37 ③	-.23	-.35	10
B	0 ⑤	-.75	-.80	-.65	5
C	-.75	0 ⑧	-.21	-.15	8
D	-.80	-.21	0 ⑨	-.45	9
E	-.65	-.15	-.45	0 ⑧	8
Empties Avail.	12	11	9	8	40

Fig. No. 4: Optimum solution

Material Deliveries			Optimum Empty Container Returns		
From	To	No. Loads	From	To	No. Loads
A	C	6	B	A	7
A	D	3	C	A	3
A	E	1	B	B	5
B	C	1	C	C	8
B	E	4	D	D	9
C	B	3	E	E	8
C	D	5			
D	B	2			
D	C	4			
D	E	3			
E	B	7			
E	D	1			

Fig. No. 5. Material movements Summary

		No. Loads
	2 LEG TRIPS	
①	A - C - A (Trip loaded A to C - unloaded C to A)	3
	4 LEG TRIPS	
②	A - D - D - B - A	2
③	A - C - C - B - A	3
④	A - E - E - B - A	1
⑤	B - E - E - B - B	4
⑥	C - D - D - C - C	4
⑦	D - E - E - D - D	1
	6 LEG TRIPS	
⑧	A - D - D - E - E - B - A	1
	8 LEG TRIPS	
⑨	B - C - C - D - D - E - E - B - B	1

Fig. No. 6: Round trips

fied by cost comparison with the present non-automated means of handling. It would seem rational, at least, that any cost comparison based upon grossly inefficient non-automated handling would show favorably for almost any other means of handling. Surely, a comparison based upon an inefficient operation is open to serious question. Some plants have already reached the stage of seriously doubting the savings predicted by automatic handling. Mathematical programming offers a means of improving upon non-automated handling prior to the making of a change.

There are several important prerequisites that must be met before mathematical programming can be applied. These are:

1. *An adequate inventory and material control.* This implies a place for everything and everything in its place. While it is much more sporting to use the "Columbus system" (hunt-and-hope-you-find-it method) of material control, it does not lend itself to improvement of the handling operations. It would be impossible to apply this approach in a plant where, for example, recently one could find cartons of the same item in four or five widely separated locations in the warehouse, because ". . . these are the only places where we had room for this item. . ."

2. *A measure of handling time between various locations.* It is necessary to have data concerning the handling time—including loading, unloading, moving loaded and moving empty—between the various departments, warehouses or other internal shipping and receiving points in the plant. Time does not have to be the only measure in that distance or cost might be employed in some cases.

3. *A valid indication of the average number of material moves required in a representative day.* This may be nothing more than a listing of number of moves with the origin and destination of each. This data can usually be compiled in a survey made over several days.

4. *A daily indication of the material shipments required for the following day.* In most industrial operations the work for the next day is known, and so the material shipments can be determined.

If these prerequisites can be met, then the problem can be tackled. Actually the study takes the form of five phases. These are:

(1) Initial survey to determine average number of material moves per day.

(2) Handling time data preparation for move times between every possible origin and destination and time required for loading and unloading in the various locations.

(3) Development of the optimum truck return trips via mathematical programming.

(More on next page)

Round Trip No.	No. of Trips	Time/Trip Hours	Total Time Hours
①	3	1.17	3.51
②	2	2.45	4.90
③	3	2.73	8.19
④	1	2.55	2.55
⑤	4	2.32	9.28
⑥	4	1.28	5.12
⑦	1	1.84	1.84
⑧	1	3.36	3.36
⑨	1	3.98	3.98
		Total Time	42.73 hrs.

Fig. No. 7: Average time per trip

No. Trucks	Round Trips	Average Time Hours	Scheduled Utilization Per Cent
1	⑨ + 2/3 ①	6.32 hours	79%
1	⑥ + 1/3 ①	6.29 hours	78.6%
1	⑦ + ⑧	5.20 hours	65%
1	2/3 ③	5.46 hours	68.3%
1	1/3 ③ + ④	5.28 hours	66%
2	⑤	4.64 hours	58%
1	②	4.90 hours	61.3%
AVERAGE PLANNED UTILIZATION 65.5% FOR EIGHT TRUCKS			

Fig. No. 8: Possible truck assignments

No. Trucks	Round Trips	Average Time Hours	Scheduled Utilization Per Cent
1	2 + 1/3 ③	7.63 hours	95.4%
1	7 + 2/3 ③	7.30 hours	91.2%
1	⑧ + ⑨	7.34 hours	91.7%
2	1/2 ⑤ + 1/2 ⑥	7.20 hours	90%
1	① + ④	6.06 hours	75.8%
AVERAGE PLANNED UTILIZATION 89% FOR SIX TRUCKS			

Fig. No. 9: Possible truck assignments

LINEAR PROGRAMMING

"Consider a . . . problem

(4) Development of the required round trips.

(5) Development of truck assignment schedules

These phases will be further illustrated in a problem.

A Problem

Consider a simple although typical problem to illustrate the mathematical programming approach to non-automated material handling.

A factory consisting of five departments or work load centers (A, B, C, D, & E) desires to improve its non-automated material handling via mathematical programming. The problem situation meets all the above prerequisites.

Material handling is accomplished with a number of the same model fork lift truck. The same type container is used for all the items handled in this manufacturing operation. (It will be shown later how this latter restriction many be modified in other problems). The containers are such that only one at a time may be handled by a truck.

The labor standards department has provided average time values for loading and unloading in the various departments and for moving loaded and empty between them.

An initial survey of the material handling operation indicates the average material moves per day as follows:

Origin	Destination	Ave. Number of moves per day
A	C	6.2
A	D	3.1
A	E	.8
B	C	1.3
B	E	3.7
C	B	3.1
C	D	5.3
D	B	1.8
D	C	3.6
D	E	2.9
E	B	7.4
E	D	1.0

Total Ave. moves per day = 40.2

Note. This does not include many material movements that occur less frequently than once-per-day.

It is necessary to round-off the average number of moves per day and to reorganize the survey data into a route table form. This is shown in Fig. 1.

The route table permits the survey data to be rather easily studied. Rounding off the number of moves and

to illustrate the mathematical programming approach . . ."

not including the less than once per day moves does introduce a degree of error. However, it will be shown later that this has little effect upon the problem.

The route table represents a part of the problem that cannot be improved upon unless the plant layout is altered or the mode of handling is changed. However, the material is being moved in containers. Unless an unlimited supply of empty containers is available at several locations in the plant, the containers being emptied during the course of the day should be returned to where they will be required for the next day's operation. The route table represents, then, only one-half of the total problem. The second half has to do with the distribution of empty containers.

No improvement can be made in the first half of the problem, assuming the truck drivers are taking the most direct path between origin and destination. However, the second part is open to much improvement.

It is possible to see the second half of the problem as a distribution type situation by modifying the route table of Fig. 1. If we reverse the "from" and "to" notation and remove the numbers from the body of the table it would become a return table as shown in Figure 2.

It is possible to look at Fig. 2 with this interpretation. *Empties required*: For example, if department A sends out an average of 100 loaded containers of material per day, it must receive an average of 100 empty containers per day to keep the system in balance. *Empties available*: If department B receives an average of 12 containers of material per day, then it must empty an average of 12 to be made available for distribution.

The return table (Fig. 2) can be modified to become what is commonly called in mathematical programming a distribution matrix. The time values provided by labor standards for moving empties between the various departments can then be inserted in the appropriate places in the matrix as shown in Fig. 3.

The numbers in the smaller boxes represent the time in hours required to move an empty container from the designated origin to the corresponding destination. Example: The .62 in the first row, first column, indicates that it requires .62 hours to move an empty container from department B to department A.

Minus signs are attached to the numbers because the desired solution must minimize the total time spent in moving empty containers. It may seem trivial in this problem to leave the squares containing a zero in the small boxes. In this problem, it requires no time to move an empty, for example, from department B to department B. However, in another problem, it may not be zero. (i.e. it may be necessary to move the empty container from one end to the other end of the department, and this would then have an effect upon the problem when developing the truck assignments.)

It is now possible to apply the distribution methods of mathematical programming to determine how to distribute the empty containers in the least total amount of time. This illustrates the definition previously given for mathematical programming. Here is a situation where many possible solutions exist, but mathematical programming can obtain the very best solution. The distribution methods have been well presented by several authors, (1) (2), and so they will not be presented here. To explain completely the distribution methods would require more time and space than is necessary to an understanding of the particular application. In fact, the return table in this problem is simple enough so that it can be solved easily by inspection. The optimum solution to the return table is shown in Fig. 4.

Mathematical programming can verify that any other plan to distribute empty containers will require more time than the above solution. This is the sum and substance of mathematical, or linear, programming in this problem. However, the problem is far from being completed as it now stands.

The moves loaded, from the initial route table (Fig. 1) and the moves with empty containers, from the return table (Fig. 4), can be combined and summarized into a tabular presentation as shown in Fig. 5.

Actually, then, Fig. 5 contains the material deliveries indicated by the initial survey and the optimum empty container returns as determined by mathematical programming (inspection in this case).

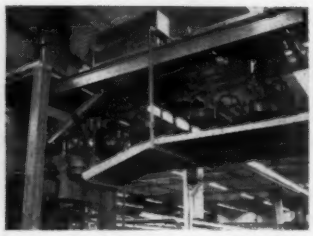
Now, step four of the phases of the problem may begin. Here it is necessary to develop round-trip assignments, beginning and ending at a particular department with alternate loaded and unloaded runs. This is most easily accomplished by inspection. For example: One round trip assignment can be from A to C with a load, then from C to A with an empty. This can be conveniently represented:

A — $\underline{C}$ — A

where the line under C indicates that it is the department that receives a required load of material. Examination of the number of times each run, or portion of

(Continued on page 124)

READY . . . SET . . . GO!



Custom

"WE REFUSE to do any more handling than is absolutely necessary."

That's the philosophy of Reliance Electric and Engineering Co. in its new No. 3 AC motors plant in Ashtabula, Ohio.

Reliance follows the theory that the best material handling system is the one that comes closest to self-elimination. While its own system does not by any means attain this Industrial Utopia, it does succeed in an unusual achievement: standard motors are built to customer specifications—in the time normally required to fill orders from the shelf. This is done by building component parts for stock, rather than order, and keeping them handy for use when needed. And it is augmented by a handling system that gets these parts *where* they're needed *when* they're needed—providing continuous flow in what is substantially a job-lot type of operation.

The plant was designed for the building of motors ranging in size from 1 to 40 horsepower. It has almost 100,000 square feet of floor space, laid out to offer the greatest possible flexibility while including the most modern techniques of automatic production. Hairline coordination, of course, is not always possible. But the overall aim is accomplished—keeping components moving with little intermittent storage.

Parts Production Based on Sales Forecasts

Manufacturing parts for stock rather than order can be dangerous. The company must always have enough of all components on hand to process incoming orders if it is to maintain the three-week delivery schedule normally quoted to customers. On the other hand, over-stocking would tie up vital storage space —defeating the very concept about which the system was designed.

To avoid over or undersupplying of parts, stock components are produced according to accurate sales forcasts and market analysis. When completed, all but the largest parts are stored in flow-type storage bins. They are placed in these bins from the rear and moved by gravity feed toward the front, where they are used on a first-in-first-out basis. There are separate racks for every modification, and they are so located that the parts are always stored adjacent to the assembly area where they will be used.

Larger parts, and those which must be moved from station to station by fork truck, are stored in collapsible wire shop boxes. These containers have specially designed legs that enable fork truck operators to stack them as many as five high in the Reliance plant.

12-Stage Automated Line For Frames

The pride of the company's production department is a 12-station automated transfer machine, used for the machining of motor frame castings for stock. This one machine does the work of a milling machine, 11 vertical turret lathes, a multiple-spindle drill and a five-spindle drill. It faces, bores, mills, drills and taps motor frames, at an average rate of about one per minute. A rough casting goes in at one end and comes out the other end ready for use, except for a rabetting operation which is done manually.

The machine will handle 36 different types of motor frame castings. Production varies from 42 to 70 framed an hour, and its efficiency is so high that through careful production planning, the company actually finds it practical for lots as small as 40 frames —in spite of its relatively high set-up time.

After the frames have been machined they are taken by overhead conveyor to a washing station, then to storage racks.

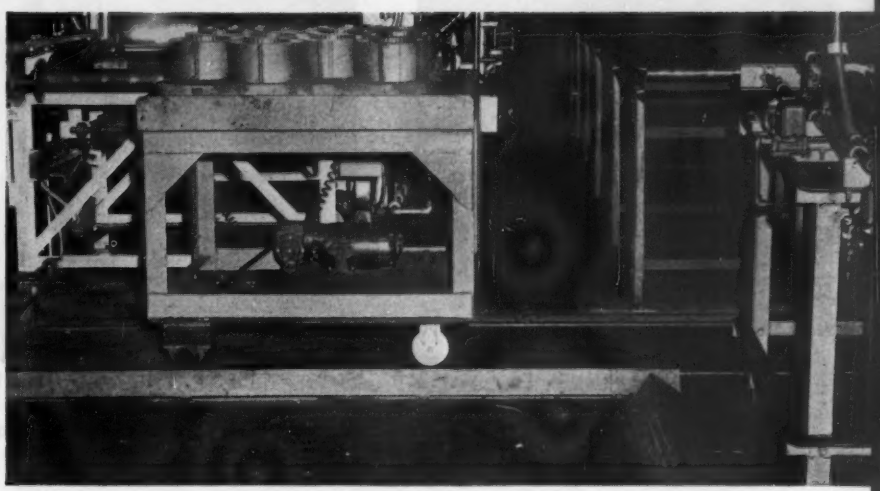
Scrap from the transfer machine, in the form of chips, turnings and similar metal particles, is collected at the control end of the machine and fed into self-dumping hoppers. These are taken by fork truck to the outside scrap disposal area when filled.

(Continued on page 84)

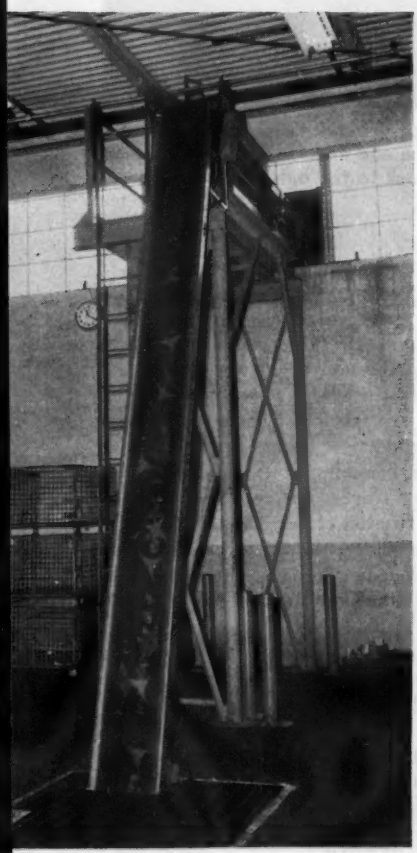
Synchronized handling system provides continuous flow for . . .

Deliveries at Off-The-Shelf Speeds

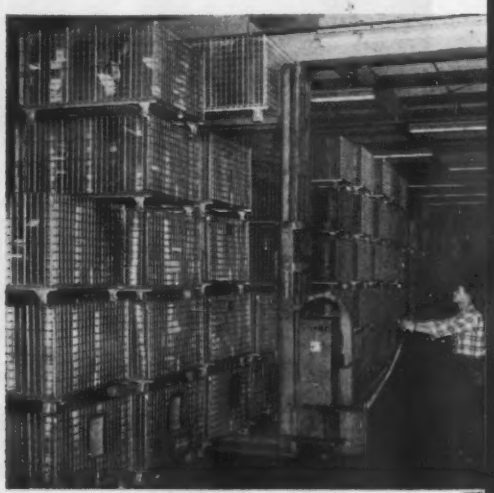
READY:
Basic components are produced for stock and stored adjacent to assembly areas.



AUTOMATIC TRANSFER TABLE is set in motion as pallet of stator cores emerges from annealing furnace. The load rides along a track to a roller conveyor, where an air-actuated arm pushes it onto the conveyor to stock.



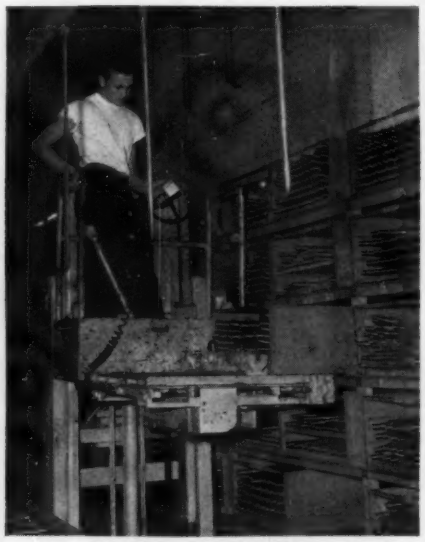
MAGNETIC BELT CONVEYOR carries scrap steel from punching station to outside disposal area.



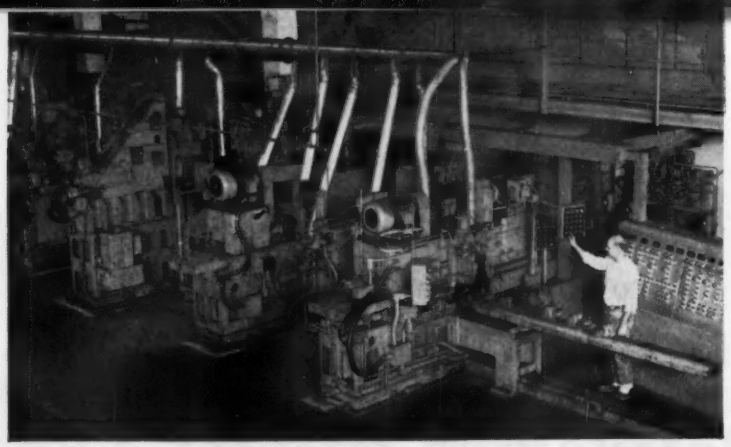
STOCK COMPONENTS are stored next to assembly areas. Rotor and stator parts are kept in flow-type storage bins (left), used on first-in-first-out basis. Larger parts are stacked by fork truck in wire shop boxes (right).

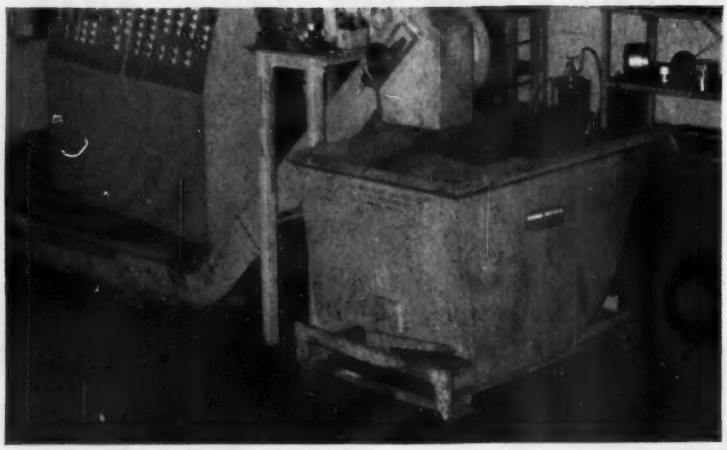
SET:

Order is received, and production of sub-assemblies begins.

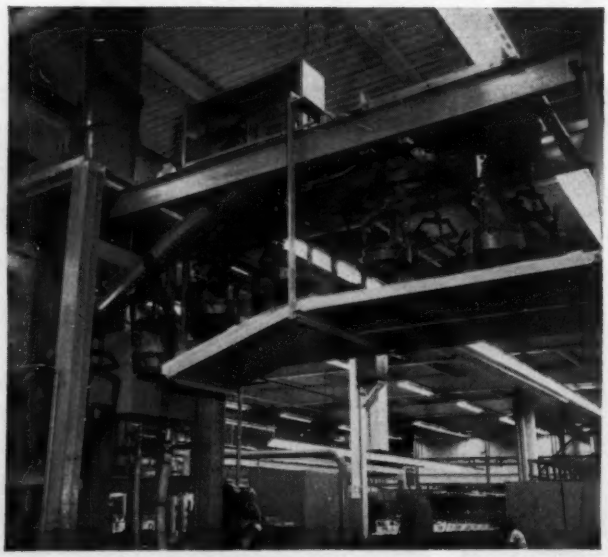


REMOTE CONTROLS allow operator to ride with load in handling items to and from stock.





12-STATION TRANSFER MACHINE (top) finished motor frame castings. Scrap from this machine is collected at one end and fed into self-dumping hoppers (bottom), then carried by fork truck to the outside disposal area.



OVERHEAD CONVEYOR equipped with scissors-like clamps carries stators through dip-and-bake station. Sequence for assembly operations is established here.

Sheet Metal Parts Require Special Handling

In addition to motor frames, Reliance also produces rotors, stator cores, shafts and end parts for stock—also according to forcast needs.

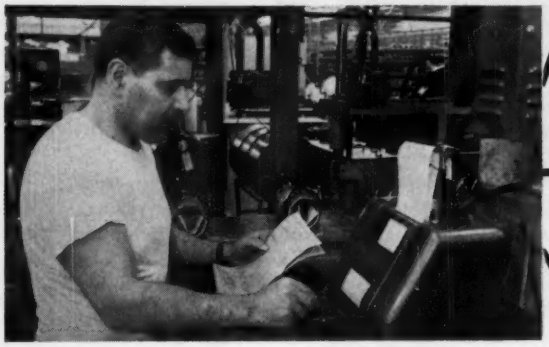
Rotors and stators are fabricated from sheet metal laminations. Their production begins in the outdoor receiving area, where incoming coils of silicon steel are received on flat-bed trucks. The coils are unloaded from the trucks by a five-ton crane. They are brought into the shop by a gasoline powered fork truck. This truck uses a ram attachment instead of forks, to "spear" the coils and transport them to the stamping area.

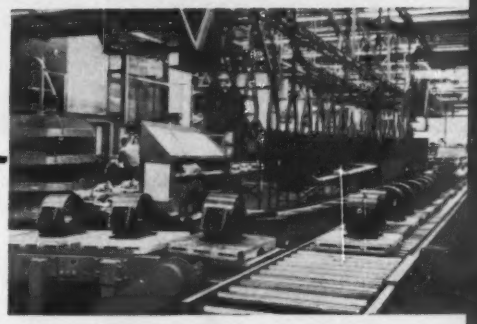
Two basic laminations, to be used as the blanks for rotors and stators, are stamped out of the coils. The coils are fed into the first press, where the rotor lamination blank, or "cookie", is punched out. The continuous strip is then fed into the second press where the stator lamination blank or "donut" is punched. The scrap from these machines falls onto a vibrating screen conveyor built beneath the floor adjacent to the presses. This vibrator moves the scrap carries it out of the plant.

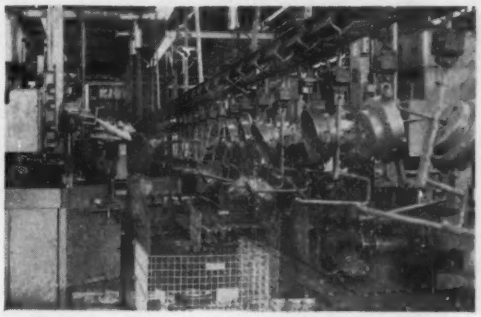
As laminations are punched out, they are split into

GO!

Electronic device flashes sequence to assembly stations.







ELECTRONIC MESSAGE RELAY located at dip-and-bake station flashes parts data and sequence to various stations ahead. Parts are drawn from storage as the message is received. These parts are then sent on to the assembly area, in proper order for assembly.

rotor or stator groups, and fed into palletized wire containers. They are then sent along to the next stations, to be built into completed cores.

Stator laminations are carried by walkie-type fork truck to an automatic welder. Here they are stacked by weight and mounted on an arbor press which compresses them and lines up the slots on each lamination. The arbor is then loaded into flip-over type carriage which allows one core to be welded while another is being loaded.

The welded laminations, which are now stator cores, leave the welding station on metal pallets and are fed by powered roller conveyor into an oxidizing and annealing furnace. These pallets are of a special alloy that is not affected by the furnace atmosphere. As a pallet of cores reaches the furnace charging table, it triggers a circuit in the furnace which will not allow it to enter until the preceding tray has moved on.

Upon leaving the oven, a pallet of finished cores triggers an automatic transfer table which carries it along a track to a gravity roller conveyor. At this point, an air-actuated push arm slides the pallet off the transfer table and on down the conveyor to stock. The table then returns alone, the track to the furnace exit for the next pallet.

Back again at the stamping area, rotor laminations are stacked in exact core length and sent to the foundry station. Here, two die-cast presses using permanent molds and injection molding techniques are set to cast the stacks into rotor cores. The operator picks up the stacks of laminations and mounts them on a keyed arbor which gives the proper skew to the slots for casting. The aligned slots form channels for the molten metal, casting the laminations into a unit.

As the rotors come from the foundry machine they are stripped from the arbor and sent by roller conveyor to a continuous annealing furnace where they are brought to a constant temperature for one hour. After leaving this furnace, they are either sent to stock or to a broaching machine, where a keyway is broached if required.

Even in sending the finished rotor and stator cores to stock there is a story in labor saving. The finished parts are loaded onto cage-type pallets and carried by electric lift truck to their storage racks. These lift trucks are equipped with remote controls so the operator can ride up and down with the load. In this way he merely has to roll the completed rotor and stator

(More on next page)

MOTORS ARE RUN-IN as they move along roller conveyor towards testing area. They then proceed through spray booths, and on to shipping department.

AS FINISHED MOTORS RIDE ON BELT CONVEYOR, they pass under shipping clerk's window. The clerk merely reaches out window to attach shipping orders.

MOTORS ARE PACKAGED in wirebound boxes or rugged corrugated containers. By the time they reach dock, papers are completed and ready to be shipped.

cores off into the storage rack shelves. Without this type of handling it would be necessary for the operator to lift each part to its proper shelf.

Customer Order Initiates Coordinated Production

Up to this point, parts have been produced for stock according to forcast needs. If the forcasts are reasonably accurate, there are enough of the major components on the shelves for orders of all various types of motors—orders which have not yet been placed but will be received in the immediate future.

When a customer order is originated, copies of the order are processed to the various key areas of fabrication by the production department. These areas will begin working upon receipt of a get-ready signal, producing the sub-assemblies which will eventually meet at the final assembly and finishing area.

Production from here on is divided roughly into two broad phases. In the first phase, stock items are taken from the shelves and put through the various operations which convert them into the sub-assemblies required for the specific order. In the second and more coordinated phase, these components converge in an established sequence toward the final assembly area. The motors are then assembled and passed on through testing, finishing, packaging and shipping stages.

When the order is first forwarded to the primary stages of production, the first semblance of synchronized flow is begun.

Coils are wound and sent by overhead conveyor to the stator assembly department, where they are joined to the stator cores coming out of stock. After the coils are mounted and the stators tested, they are sent by live roller conveyor to the varnish department, where they are dipped and baked. These parts move through the varnish and bake stations on an overhead conveyor. Special scissors-like clamps, suspended from the trolleys, are used to hold the parts on this conveyor.

Synchronization Begins Here

The coordinated sequence for all following operations is established during the dip and bake operation. Up to this point, although specific orders are now being processed, it has been impossible to set up the assembly sequence for ensuing operations. This is because various orders take longer than others to reach this stage, depending on their individual specifications. However, once they reach this station they are in the order that they will follow for the balance of operations. So it is now possible to coordinate all forthcoming processes in advance—based on the sequence in which they pass through varnish and dip.

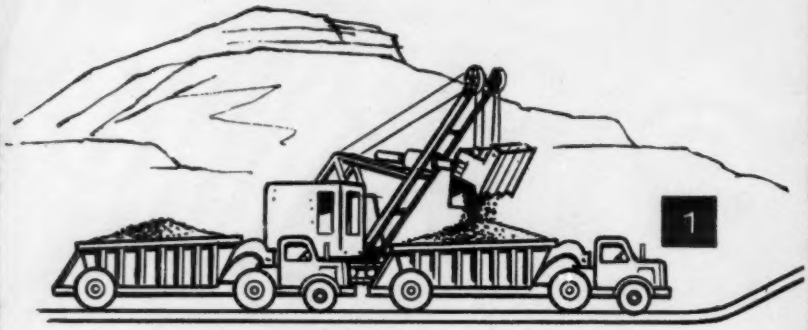
While the cores are being cleaned prior to varnishing, an operator at an electronic message station removes the order from the core, and takes from it the necessary parts lists and processing data for the ensuing assembly operations. The message sending device is an electronic mechanism that relays the message to any number of independently located receiving

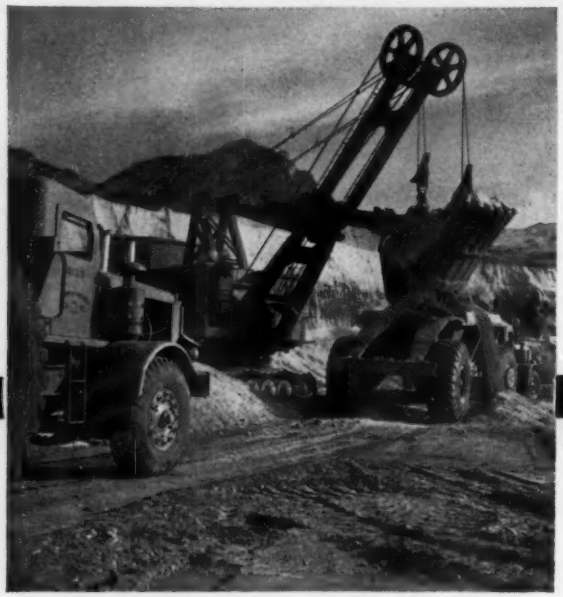
(Continued on page 160)

MOVING A MOUNTAIN . . .

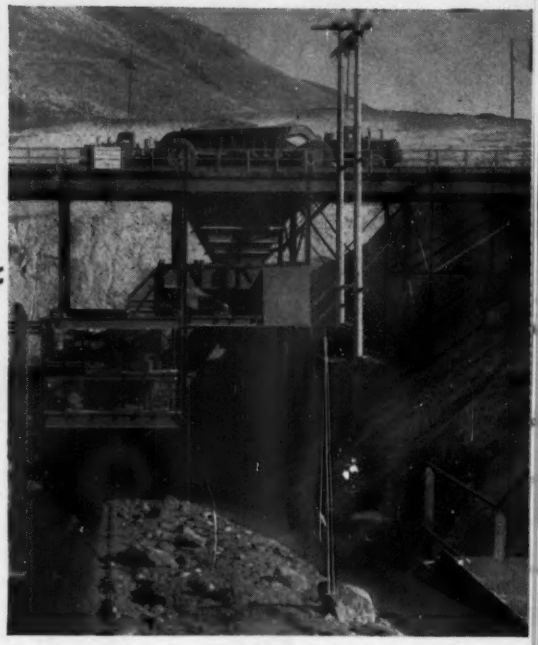
. . . may be out of your line, but these sound techniques can be applied to operations involving the bulk movement of materials in many other operations.

This installation takes a mountain and dumps it into a lake two miles away. See story on the next page.





1. Gravel is dug from hillside . . .



2. Crushed, fed to conveyor . . .

STRANGE THINGS ARE HAPPENING in the area of Great Salt Lake, Utah. A mountain is being moved two miles across a valley and dumped into the water. A conveyor system is generating electricity instead of using it.

Scene of these events is the Southern Pacific Railway's right of way—about 50 miles due north of Salt Lake City—where engineers are setting out to build a dry-land roadbed across 13 miles of lake. This ribbon of road will consist of millions of tons of gravel, scratched out of a convenient hillside.

Relocation of a mountain is no easy job. To do it will take some 25 million tons of gravel—enough to make a pile 14 miles high if stacked on a baseball diamond. The entire project will cost Southern Pacific about $49 million. It is scheduled for completion in 1960.

The gravel is dug from a nearby hill by power shovels, carried by an elaborate conveyor system to a storage pile at the water's edge, then loaded into barges to be discharged into the lake.

Digging Is by Electric Shovel

Three 300-horsepower electric shovels gouge the gravel out of the mountain in 8 cubic yard bites. Then it is trucked to a dumping station and deposited in hoppers that feed the conveyor system. As the continuous line of 35-ton trucks unloads at the dumping trestles, the gravel is screened through 6 x 14 foot vibrating screen frames. Stone 8 inches in diameter and over is crushed in special jaw crushers before it goes into the hoppers.

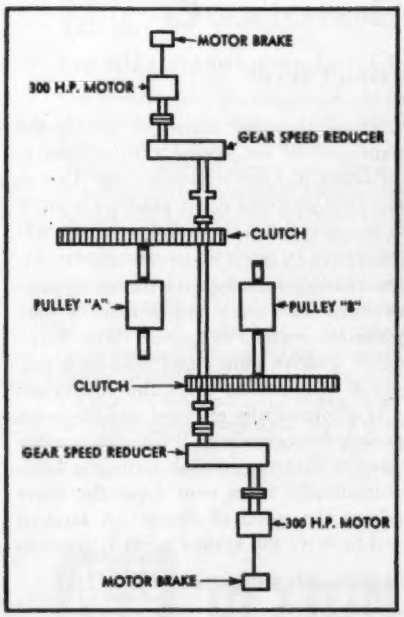
Conveyor Can Be Extended

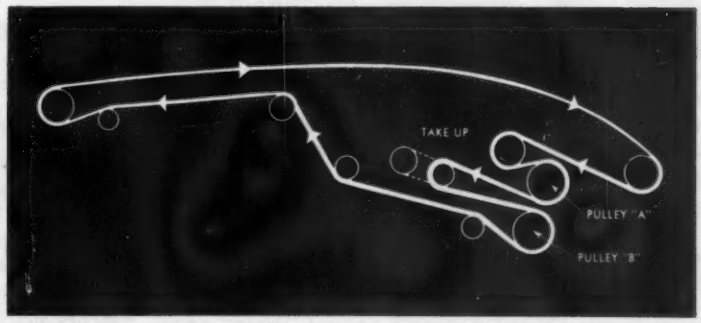
The conveyor system presently consists of two main cross-country conveyor units plus 11 smaller units—linked together to provide continuous flow from the mountain to the lake. As the digging progresses further away from the lake, a third main unit will be added to bridge the gap.

(Continued on page 90)

Continued

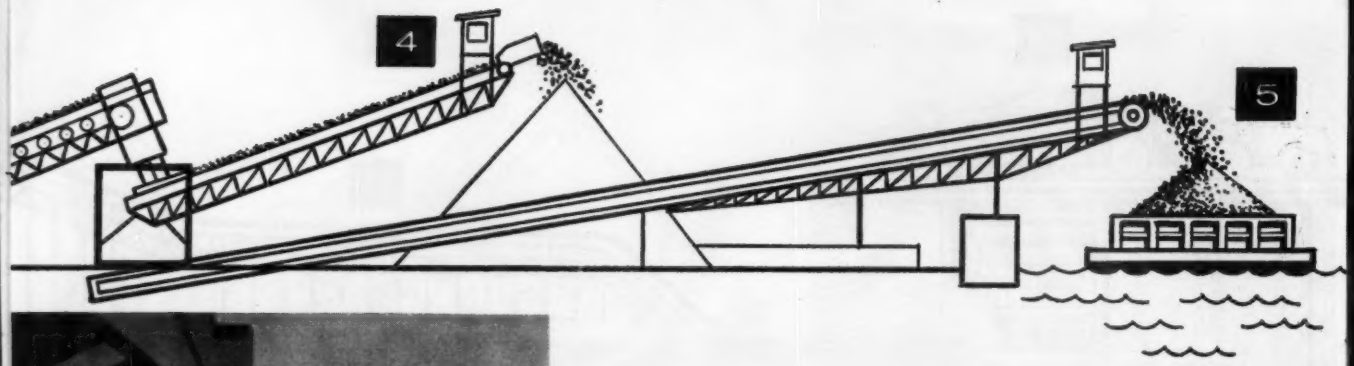
3. Carried two miles across country . . .





CONVEYOR SYSTEM employs special drive units for power to start. Once it gets rolling, gravity causes motors to act as generators creating digging power.

WHEN POWER IS REQUIRED to drive conveyors, drive pulley "A" is engaged and holdback pulley "B" remains free-wheeling. When gravity overcomes friction, holdback pulley engages to halt down-hill speed.



4. To the shore where it is . . .

5. Loaded into barges and dumped into lake.

More than 23,000 feet of conveyor belting is utilized, and over 4700 belt conveyor idlers. The nature of the job and the physical conditions at the site would not permit the use of a single straight-line conveyor. Thus the mainline belts, each approximately 4000 feet long, are laid in "dog leg" fashion. This presented design problems at the transfer points, because enormous tonnages must change directions at high speeds as they pass from one belt to another.

Capacity of the system is 75,000 tons a day, when conveying the gravel at an average rate. When operating at full capacity, this rate can be increased to 90,000 tons a day.

Belts on the main conveyors are 54 inches wide and travel at 850 feet a minute—roughly twice the speed of conventional installations. They handle an average of 4200 tons of material an hour. To prevent excessive belt wear at these speeds, accelerating conveyors 30 feet long and 60 inches wide are used at the loading hoppers and at transfer points on the main line, where one conveyor unit transfers the load to another. These accelerator belts move the material 500 feet per minute, thereby easing the transfer to the main belts running at 850 feet per minute.

Generates Its Own Power

Even more unusual than the conveyor size is the fact that the main part of the system creates electric power instead of using it, once it gets rolling. This is because the main sections coast down-grade. The drop in altitude from the gravel hill to the lake—about 400 feet—enables the system to generate its own electricity.

A special, patented drive mechanism transmits power to the conveyors to start them and to control their speed. This mechanism consists of special "Won Way" clutches attached to a drive pulley and hold-back pulley. When power is required to drive the conveyors, the drive pulley is automatically engaged and the hold-back pulley remains free-wheeling. When the gravity force becomes greater than the friction force, the hold-back pulley automatically takes over from the drive pulley and regulates the speed of descent. A total of 27 motors is used to drive the system when it requires

(Continued on page 94)

Cut your costs with ACME STEEL Dexion Slotted Angle

the idea framing material for all installations

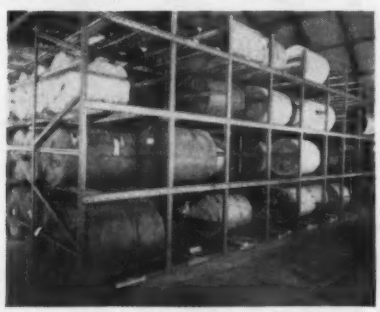
Frame whatever plant equipment you may need, including electrical installations, more easily, quickly and at reduced costs with Acme Steel Dexion Slotted Angle.

Dexion Slotted Angle measures, cuts and bolts together at the job site. Light and compact, Dexion Slotted Angle is packaged in 10-length units, complete with nuts and bolts.

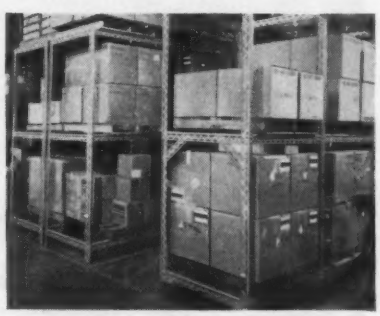
For any kind of framing, Dexion Slotted Angle slot and hole patterns always match up, a special feature whether for custom building storage racks or hanging and installing electrical equipment. And strength factors allow stable, safe frameworks for holding hundreds of pounds. A wrench and the portable Dexion Cutter are the only tools needed. No drilling or welding . . . merely cut and bolt the pieces together to your exact specifications.

Cold-rolled, galvanized steel Dexion Slotted Angle is available in two sizes—standard and heavy duty. And it is completely reusable. A free Idea copy of the "Dexion Construction Guide" is yours for the asking. Just write Dept. FDD-57, Acme Steel Company, Chicago 27, Illinois.

ACME STEEL Dexion Slotted Angle frames tote pan rack for parts storage.



ACME STEEL Heavy-duty Dexion Slotted Angle racks weighty paper rolls.



ACME STEEL Dexion Slotted Angle used for stationary and mobile pallet racks.

ACME STEEL **DEXION SLOTTED ANGLE**

Circle No. 1 on Reader Service Card for more information

for Unloading..

Because the new model HA "PAYLOADER" tractor-shovels are fast, flexible and efficient for unloading boxcars, more and more industrial users of loose, dry materials now specify that shipments be made in bulk at substantial savings in freight rates and handling costs.

This little "PAYLOADER" handles larger loads and delivers more tons per hour than heavier machines with bigger engines, yet has a smaller turning radius for better maneuverability in and around boxcars.

The 40-degree tip-back of the bucket at ground level permits the operator to get and hold big loads close and low. The hydraulic load-shock-absorber, a standard equipment feature, makes it possible to carry and move more material with less spillage, faster, with better stability and greater safety.

For loading or unloading boxcars or stockpile work, this new HA "PAYLOADER" enables the same operator to handle from 50 to 100% more material according to actual user reports.

Depending on the weight of the material to be handled, buckets are available with payload capacities from 12 cu. ft. to 36 cu. ft. The rated carry capacity of the HA is 2,000 lbs. at an average speed of 4 m.p.h.

Your nearby "PAYLOADER" distributor will be glad to demonstrate. The Frank G. Hough Co., 731 Sunnyside Ave., Libertyville, Ill.

76A

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

Circle 70 on Reader Service Card for more information

for Carrying..

This new model HA "PAYLOADER" is more than just an efficient machine for digging, moving and delivering bulk materials. It is also a multi-purpose materials-handling handyman because of the many useful attachments available for quick interchange with the bucket.

Many industrial firms make use of the lift forks for handling and stacking of palletized loads or individual pieces such as frames, castings, etc., as well as the regular bucket handling of bulk materials. Users often solve "part-time" operational needs with "PAYLOADER" attachments and eliminate additional investment in special equipment.

The load-shock-absorber built into the hydraulic system of the model HA, cushions the pallet load, reduces jouncing, improves the ride and permits faster speeds, with safety.

A closed, pressure-controlled, double-acting hydraulic system and the exclusive single-lever bucket control gives the operator simplified, easy and precise regulation of lifting and tilting operations.

In addition to lift forks there are tine forks, snow plows, sweepers and numerous other attachments available. Your "PAYLOADER" distributor will be glad to discuss your requirements and make recommendations. The Frank G. Hough Co., 731 Sunnyside Ave., Libertyville, Illinois.

76B

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

Circle 71 on Reader Service Card for more information

for Sweeping..

It's easy to make a good-housekeeping tool out of a new model HA "PAYLOADER" whenever you need to clean floors, aisles, driveways or outdoor storage areas. In just a few minutes you can fit this sweeper attachment on the bucket. It is complete with a separate hydraulic motor which powers the rotary broom.

You can sweep a four-foot swath right into the bucket and when the bucket is loaded, it can be raised and dumped into a bin or a truck or a pile, as desired.

If the model HA "PAYLOADER" is kept completely busy during the day on regular bulk-handling operations, some users recommend that the sweeper attachment activities be accomplished during "after-hours" or during night-shift operations.

Perhaps you want the HA to help clean up after a snowfall. You can use the standard bucket to push or load, you can have a snow plow attachment, or a larger snow bucket.

This unit, and most of the other models in the complete "PAYLOADER" line, offer a choice of engines for gasoline, diesel or LPG.

Literature on the complete line of "PAYLOADER" machines and their attachments, and the name of your distributor is yours for the asking. The Frank G. Hough Co., 731 Sunnyside Ave., Libertyville, Illinois.

76C

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

Circle 72 on Reader Service Card for more information

for Pushing..

Another of the many part-time or full-time jobs which can be handled with these new model HA "PAYLOADER" units concerns the pushing or towing of trailer loads.

Pushing is a full-time job for the model shown above. Equipped with a stubby lift-fork attachment, it moves as many as seven loaded kiln cars (28,000 lbs.) at one time in this brick plant. Placing the forks under the end car and lifting transfers additional weight loads to the driving wheels to provide exceptional traction.

This HA "PAYLOADER" replaced two conventional towing tractors — does the job better, at much lower costs. The torque-converter drive provides a steady push that avoids jamming the cars and spoiling brick.

Full-reversing transmission has two speeds in each direction and, combined with the torque-converter drive, gives simple, easy and fast operation with the need for foot clutch operation all but eliminated.

There are few, if any, pieces of materials-handling equipment which offer the user as much in the way of flexibility, versatility and performance as these HA "PAYLOADER" units. A nearby distributor is ready to offer his services. He has complete parts and service facilities to keep your "PAYLOADER" a profitable investment. The Frank G. Hough Co., 731 Sunnyside Ave., Libertyville, Illinois.

76D

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

Circle 73 on Reader Service Card for more information

MOUNTAIN MOVING . . .
(*Continued from page 90*)

power and to hold it back when it travels by gravity. These motors are connected to the pulleys through specially designed speed reducers.

Energy Converted to Electrical Power

Energy created by the gravitational glide is converted into electrical power by the motors which, in effect, become electrical generators. This electric power—actually a by-product of the system—is captured and put back to work within the system. The wiring is arranged to feed it back to the three electric shovels to supplement the power needed for digging the gravel out of the hill. Engineers estimate that the amount of electricty obtained in this way amounts to over 600,000 watts an hour—enough to meet the power requirements of about 4000 average size homes!

At the end of its downhill ride of a little less than two miles, the material is transferred to a radial stacker capable of building a 250,000-ton storage pile 70 feet high. This stacker is equipped with a 54-inch belt conveyor mounted on a 164-foot radial boom. It is necessary to build a stockpile, or surge pile, because the gravel arrives at the edge of the lake in a steady stream but is carried away intermittently by the barges.

Tunnels in Conveyors

Under the surge pile are two tunnels housing a pair of 72-inch conveyors. These conveyors, running at 600 feet per minute, have a combined capacity of 12,000 tons and can load a 3000-ton barge in 15 minutes. Material is fed into the tunnel conveyors by ten overhead belt feeders which closely control the rate of delivery, preventing surges and assuring a constant flow of gravel at full rate without spillage. The tunnel conveyors carry the gravel 250 feet to the edge of the lake and feed it into the special barges. These barges in turn transport the gravel out onto the lake, where it is dumped into position. They are 250 feet long and 55 feet wide, and are said to be the largest drop-bottom barges ever built.

To insure quick location and correction of trouble should it occur anywhere in the conveyor system, a series of six electronic indicators is spotted along the route. These units are designed to automatically bring the equipment to a stop in the proper sequence, and notify the operators where the trouble is located.

The new roadbed will run parallel to and about 1500 feet north of the present wood trestle. To provide a solid foundation for the fill, the lake bottom is being dredged to remove soft, unstable material. The contractor estimates that 15 million cubic yards of material will be dredged out, creating an under-water trench 170 to 475 feet wide and 20 to 35 feet deep. After the fill is put in place, the top will be reinforced with heavy rock to resist high waves that sweep the lake in stormy weather.

Photos courtesy Hewitt-Robins.

Outperforms and Outvalues ALL LIFT TRUCKS in its class
Regardless of Price
$397.50
WE INVITE COMPARISON
1500 lbs. Load Capacity
Engineered... YEARS AHEAD
• Complete bearing control throughout
• Synchronized 12-volt heavy duty system
• Feather-controlled stops
• Equipped with automatic charger and heavy duty industrial battery
• Self-alignment dual floor brakes
Operates in 28" Aisle
MORE THAN 40 BIG JOE MODELS
• Range up to 2000 lbs. capacity
• Lifting heights to 130"
NEW 24-PAGE CATALOG
In-Between Handling is our business! For the solution to your problems, write for our new 24-page catalog. BIG JOE Manufacturing Co., Kilburn Ave., Wisconsin Dells, Wis.
BIG JOE
Hydraulic Lift TRUCKS
EXPORT DIVISION:
400 W. Madison St., Chicago
BIG JOE
MANUFACTURING COMPANY
Kilburn Ave.,
Wisconsin Dells, Wis.
Circle No. 23 on Reader Service Card for more information

SIMPLE CONTROLS

Convenient to operate — easy to service.

BRAKE

Exclusive design puts it on the wheel where it belongs.

ELECTRIC-HYDRAULIC LIFT

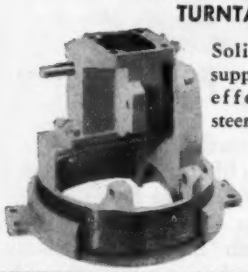
Integral pump and motor. Exposed oil lines are eliminated to prevent leakage.

MOTO-TRUCS

Your BEST protection against down-time!

BALL BEARINGS TURNTABLE

Solid load support plus effortless steering.



DOUBLE WHEEL SUPPORT

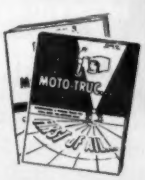
No cantilever loading—axle held rigidly on both sides.

ACCESSIBLE CONTROL PANEL and MAIN POWER CUT-OFF

No complicated circuits — easy to service. For safety — Main power is cut off when steer handle is vertical.

GET ALL THE FACTS!

Write for either or both of these new catalogs: 56-R "Ride-A-Man" or 56-W "Walkie" Models

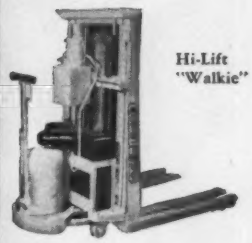


Simple . . . rugged construction keeps MOTO-TRUCS *on the job!*

These nine important construction features — found on all Moto-Truc models — mean fewer breakdowns, and lower operating cost.

Moto-Trucs are tough and rugged. Maintenance is fast and easy, too! Vulnerable gadgets and frills that increase cost but add nothing to handling efficiency are eliminated.

Moto-Truc's sound engineering principals are your insurance of top materials handling performance. Always insist on Moto-Truc — there is a "walkie" or small riding model for every handling need.



Hi-Lift "Walkie"

Pallet Type "Walkie"

Platform "Walkie"

Grip-All Tractor

Largest exclusive manufacturers of "Walkies" and Ride-A-Man Trucks

MOTO-TRUC — Designed FOR THE INDUSTRY — PATENTED

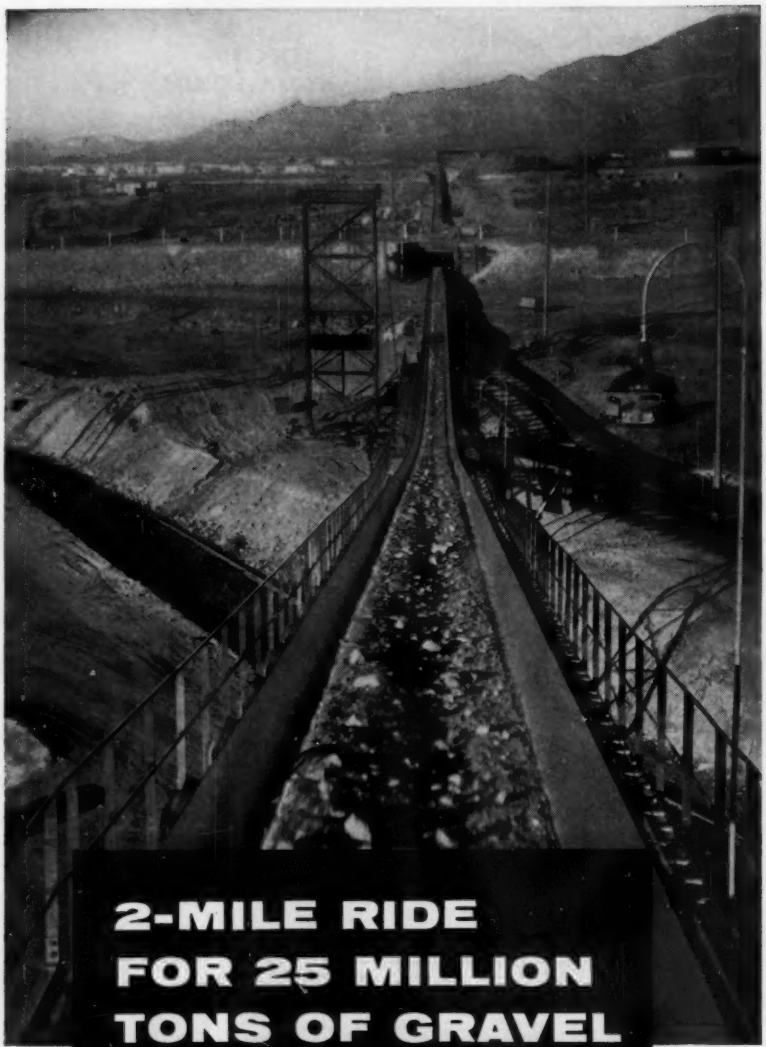
The MOTO-TRUC Co.

Representatives in Principal Cities

1955 E. 59th St. Cleveland 3, Ohio

Pallet . . . Platform . . . Hi-Lift Truck

Circle No. 108 on Reader Service Card for more information



To help build Southern Pacific Railroad's 13-mile roadbed across Great Salt Lake, Morrison-Knudsen Co. had Hewitt-Robins develop a bulk materials handling system. In ton-miles-per-hour capacity, this system surpasses any previous belt conveyor installation. Its conveyors travel at speeds up to 850 fpm, carry 75,000 tons of rock and gravel per day, load barges at 12,000 tons per hour.

The entire installation—including 3 scalpers, 13 conveyors, 23,000 feet of belting, 4,700 idlers, a 164-ft. radial stacker, 10 belt feeders, 2 recovery conveyors and 27 speed reduction drives—was designed, manufactured and delivered by Hewitt-Robins in less than eight months. To find out how H-R products and services can help you, consult your classified telephone directory for the nearest H-R representative, or contact Hewitt-Robins, Stamford, Conn.

HR HEWITT-ROBINS

CONVEYOR BELTING AND IDLERS . . . POWER TRANSMISSION DRIVES
INDUSTRIAL HOSE . . . VIBRATING CONVEYORS, SCREENS & SHAKEOUTS
Circle No. 69 on Reader Service Card for more information

CATALOGS . . .

(*Continued from page 44*)

Mechanical Loading Ramps . . . ten ton capacity. Counterbalanced design eliminates cylinders, pumps, motors, starters, piping, valves, wiring, gears and cables. Not affected by dirt, debris or extreme heat or cold. Easily installed and furnished complete. Full details are available from Loomis Machine Co.

Circle 94 on Reader Service Card

Magnesium Dockboards . . . are easy to lift, carry and position. They can be used on both rail and truck docks. Complete information about their magnesium dockboards, loading ramps and hand and platform trucks is available from Dow Chemical Co.

Circle 48 on Reader Service Card

Automatic Bag Packer . . . has a new simple design for free-flowing or semi-free-flowing feeds, fertilizers, etc. Simplified operation and maintenance. Automatic sewing reduces bag size and cuts cost. Packs from 20 to 25 miltiwall bags per minute with one operator. Detailed information is available from International Paper Co., Bagpak Div.

Circle 79 on Reader Service Card

44% More Capacity . . . is the claim made by The Electric Storage Battery Co. for their TG Exide-Ironclad battery. With it, you can replace a 500 ah battery with 720—in the same size. Complete information is available from the company.

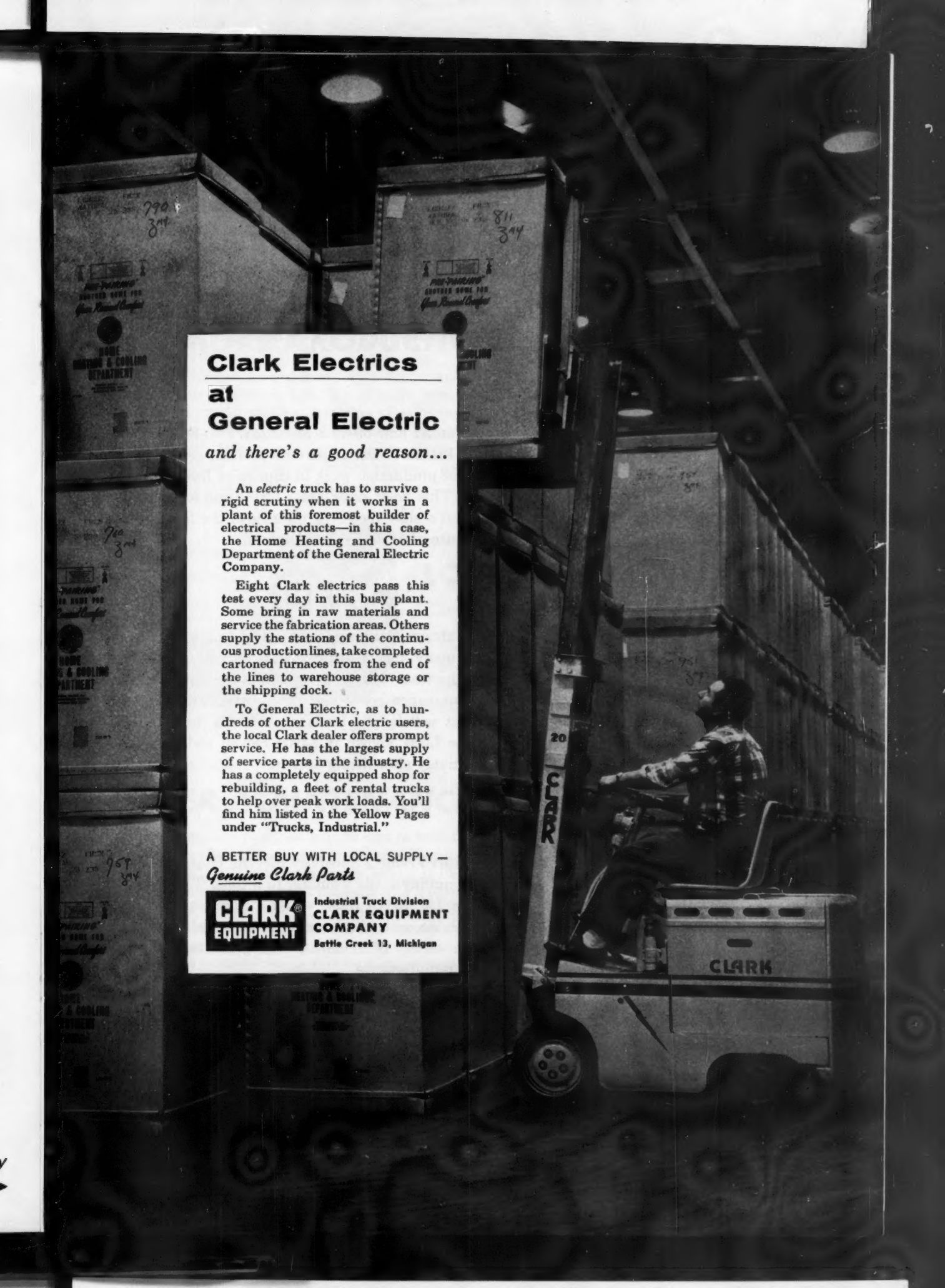
Circle 51 on Reader Service Card

Industrial Truck Attachments . . . among other attachments available is the hydro clam scoop designed for industrial fork truck use. Blade without sides is easily pushed under material. Side plates furnished for handling granular material. Information on their complete line is offered by Materials Transportation Co.

Circle 175 on Reader Service Card

FLOW

Circle 36 on Reader Service Card →



Clark Electrics at General Electric

and there's a good reason...

An *electric* truck has to survive a rigid scrutiny when it works in a plant of this foremost builder of electrical products—in this case, the Home Heating and Cooling Department of the General Electric Company.

Eight Clark electrics pass this test every day in this busy plant. Some bring in raw materials and service the fabrication areas. Others supply the stations of the continuous production lines, take completed cartoned furnaces from the end of the lines to warehouse storage or the shipping dock.

To General Electric, as to hundreds of other Clark electric users, the local Clark dealer offers prompt service. He has the largest supply of service parts in the industry. He has a completely equipped shop for rebuilding, a fleet of rental trucks to help over peak work loads. You'll find him listed in the Yellow Pages under "Trucks, Industrial."

A BETTER BUY WITH LOCAL SUPPLY —
Genuine Clark Parts

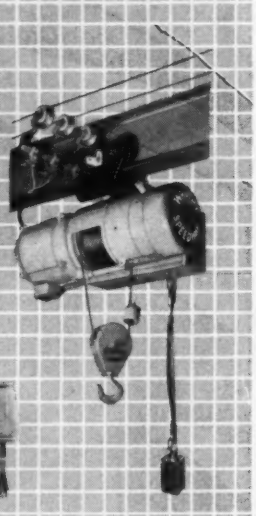
CLARK® EQUIPMENT

Industrial Truck Division
CLARK EQUIPMENT COMPANY
Battle Creek 13, Michigan

WRIGHT Electric Hoists f

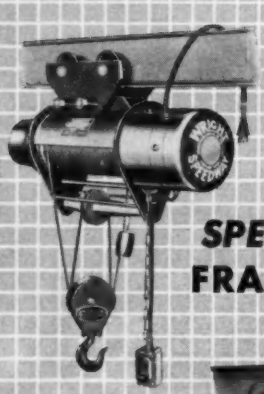
NEW ELECTRIC CHAIN HOIST

The new WRIGHT Electric Chain Hoist is available in two size capacities: 300 to 2000 lbs. (single chain) and 3000 to 4000 lbs. (double chain). It is safe, easy to operate, rugged and durable. It is exceptionally valuable for use on production lines, over machine tools or any shop location where space is at a premium.



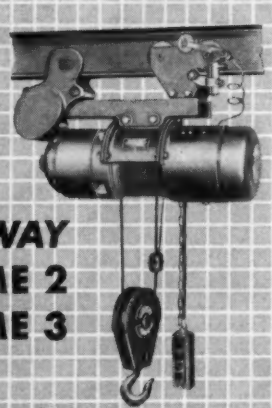
2-SPEED SPEEDWAY FRAME 1

WRIGHT now offers a *Speedway* Two-Speed Hoist in the Frame 1 size. It permits precise, gentle positioning of production work in capacities from ¼ ton to 1 ton. This hoist gives a fast lifting and lowering speed —and a slow speed (¼ the rate of the fast speed) by the use of 1800/450 RPM motors.



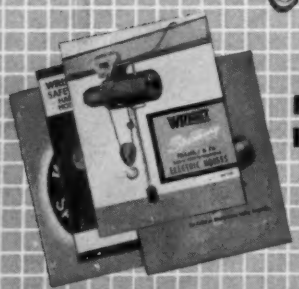
SPEEDWAY FRAME 1½

WRIGHT *Speedway* Electric Hoists are built to meet the many and varied demands of modern high-speed production. Many design improvements minimize maintenance costs and down-time. The Frame 1½ Hoist will handle loads of from 1½ to 2 tons. The Type L-1½ shown is 4-part reeved and intended for relatively slow lifting speeds.



SPEEDWAY FRAME 2 FRAME 3

WRIGHT Frame 2 *Speedway* Electric Hoists are capable of handling loads from 1½ to 6 tons. The Frame 3—from 1½ to 10 tons. WRIGHT *Speedway* Hoists are available with single or variable speeds and with a wide variety of mounting arrangements to meet specific requirements.



FOR COMPLETE INFORMATION

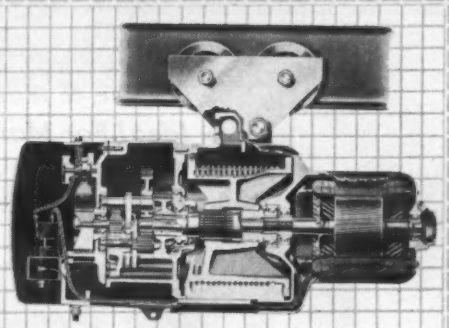
Ask for the following booklets for complete information on WRIGHT Hoists and Crane components: Speedway Hoists (Frame 1-1½) Booklet DH-133B, (Frame 2 and 3) Catalog E-55B • Motor Driven Cranes—Underhung, Single Bridge—Bulletin #227; Top Running Cranes—Bulletin DH-448 or DH-449 • Crane Drive Units—Booklet DH-431A • Hand Traveling Cranes—Bulletins DH-468 and DH-348B.

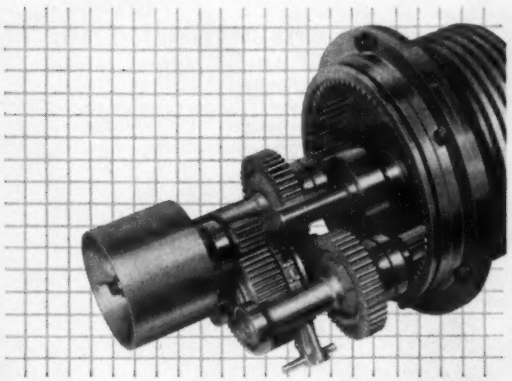
ts for Lowest Final Cost

THESE FEATURES MAKE WRIGHT *SPEEDWAY* HOISTS YOUR BEST BUY FOR—

MORE PRODUCTION

Fine balance and heavy duty design makes possible the continuous handling of tough jobs on any duty cycle for which a 30-minute NEMA motor is satisfactory. All gears and pinions are alloy steel, heat-treated. Their ductile core supplies shock resistance to the most severe service stresses. Antifriction bearings are used throughout.





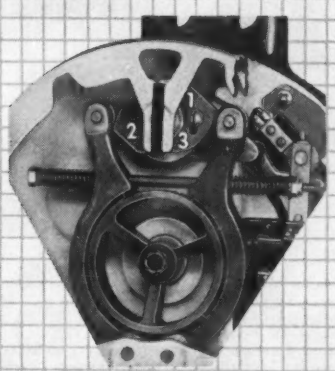
LONGER LIFE

Strength of gear teeth of WRIGHT Frame 2 and Frame 3 SPEEDWAY Hoists has been doubled by a change in contour and grain structure of the metal. Internal gear ring and heavy flanged cross section is bolted to the drum at six points and provides extreme resistance to distortion.

EASIER MAINTENANCE

There is nothing to adjust but the cam to keep the brake in perfect adjustment. When excessive load drift occurs...just remove the screw shown at Position **1**, swing the cam until Position **2** is in line, and replace the screw. Position **3** is provided for the final third of brake lining wear. Brake springs and solenoid never need adjustment.

Circle No. 5 on Reader Service Card for more information

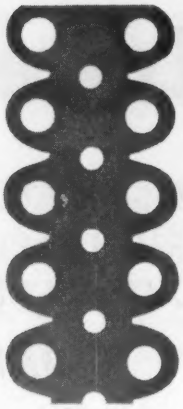


Wright Hoist Division
AMERICAN CHAIN & CABLE

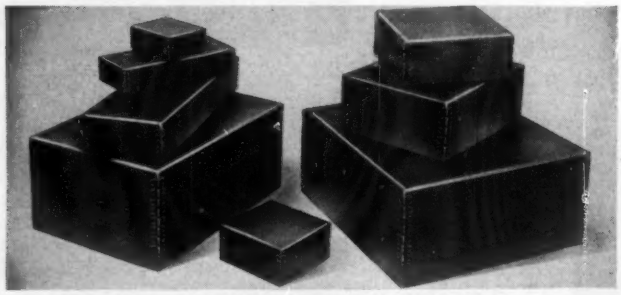
York, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

ACCO

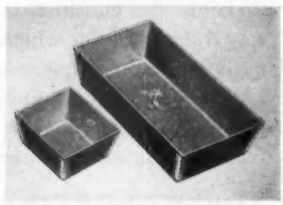
METAL EDGE materials control specialties



- *Lightweight, Sturdy, Grease & Water Resistant*
- *Ideal For Many Industrial Needs*
- *Protect Parts and Components*
- *Help Speed Production Flow*

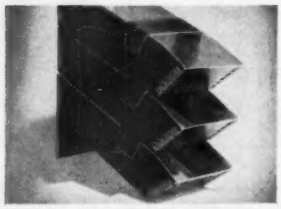


STANDARD STOCK BOXES—Available in a variety of sizes these reusable full-telescope boxes are ideal for storing materials or for use as separate trays.



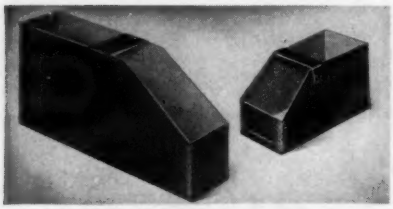
SUPER FIBRE BOARD TOTE TRAYS

For Materials Handling on production lines... assembling orders ... shelf storage. Metal edged for strength... Celolustre coated for grease and moisture resistance.



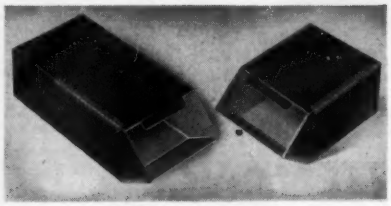
PRODUCTION LINE HOPPERS

Inexpensive interlocking hoppers hold component parts in 2 or more tiers on assembly lines. Lightweight, sturdy... cut assembly time... reduce labor costs.



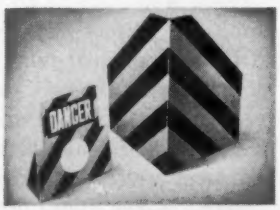
MATERIALS HANDLING DRAWERS

Ideal for bulk storage of small parts on steel shelves. Lightweight, strong and durable. Made with reinforcing strap across top.



METAL EDGE BIN BOXES

Designed to fit standard steel shelving... convenient for handling and storage of nuts, bolts and other small parts. Made of durable Super Fibre Board with Celolustre treatment. Dustproof type also available.



WAREHOUSE CORNER MARKERS AND SAFETY SIGNALS

Corner markers clearly indicate and protect stacks of materials. Signals warn of danger indoors and out... on repairs, construction jobs and in assembly areas.

NATIONAL METAL EDGE BOX COMPANY
1202 Callowhill Street
Philadelphia 23, Penna.

Please send Brochure and Price Sheet on your Materials Handling Specialties ☐. Please send your "Packaging Tool Box" ☐.

Name .....

Title .....

Company .....

Address .....

City ..... Zone ..... State .....

Send for Brochure and Price Lists on Materials Handling Specialties and Free "Packaging Tool Box". It's a handsome re-usable container with 3 booklets that show you how to increase sales through better packaging; make packaging more profitable; and simplify materials handling and inventory control.

By the Manufacturers of the Engineered Method For Materials Handling, Inventory Control and Packaging

NATIONAL METAL EDGE BOX COMPANY

1202 Callowhill Street • Philadelphia 23, Penna.

Circle No. 111 on Reader Service Card for more information

PACKAGING AND SHIPPING SECTION

TABLE OF CONTENTS

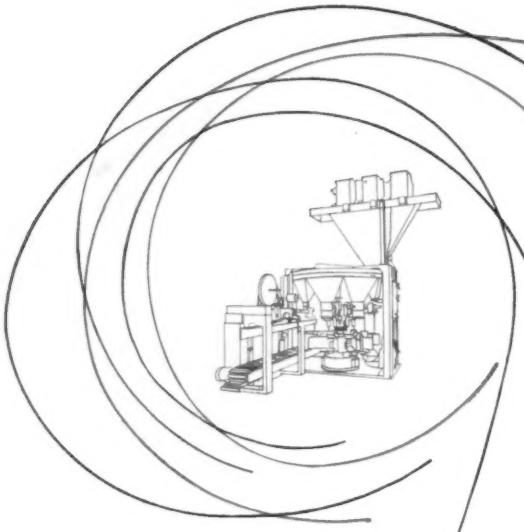
Unitization of Irregular Shapes 103

Packaging and Shipping Idea of the Month 106

Simultaneous Baling and Packaging 110

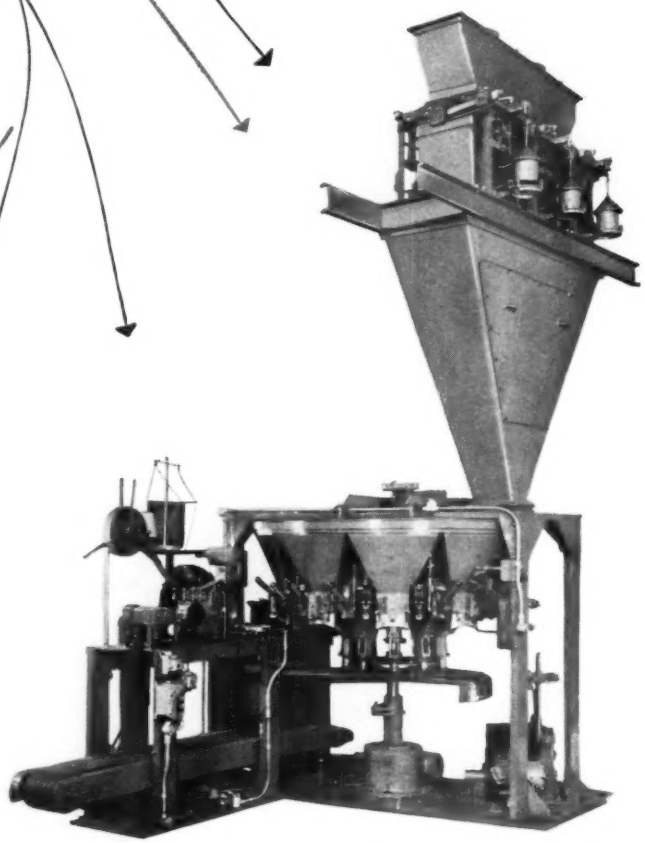
Why Trailer-Carrying Vessels? 116

Pre-Planned Module Decking Increases Capacity 50% .. 120



THE BEST

FOR 25 YEARS



Now

WITH IMPROVED DESIGN

"THE BAGPAKER"* IP's NEW, Model "AF"

"The BAGPAKER"* Model "A" for 25 years has proved there is no better method than the rotary turret for maintaining a high packing rate. Not one Model "A" Bag Packing Machine installed by us has ever been replaced by another design.

Now this proven machine has been modified and simplified, incorporating all the improvements indicated desirable in 25 years of unrivalled successful operation.

"THE BAGPAKER" NEW MODEL "AF" FEATURES:

- *New Simple Design—for free-flowing or semi-free-flowing feeds, fertilizers, etc.*
- *Simplified Operation and Maintenance.*
- *Automatic sewing reduces bag size—cuts cost.*
- *Packs from 20 to 25 multiwall bags per minute with one operator.*
- *LOWER COST.*

For detailed information, call or write F-5 –no obligation

International Paper COMPANY

BAGPAK DIVISION

220 EAST 42ND STREET, NEW YORK 17, N.Y.

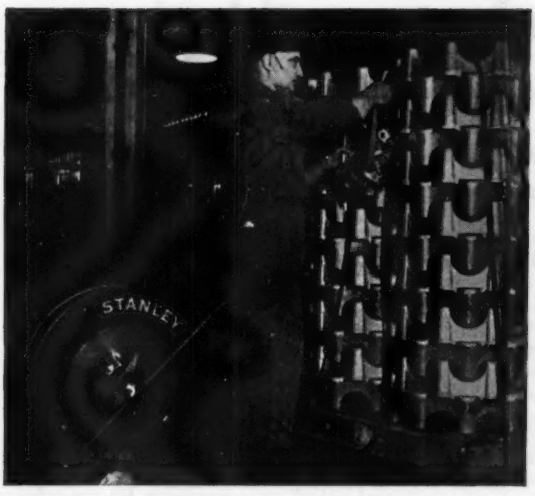
BRANCH OFFICES: Atlanta · Baltimore · Boston · Chicago · Cincinnati · Cleveland · Dallas · Denver · Kansas City, Kansas · Los Angeles Minneapolis · New Orleans · Philadelphia · St. Louis · San Francisco · IN CANADA: The Continental Paper Products, Ltd., Montreal, Ottawa, Toronto

Circle No. 79 on Reader Service Card for more information

CYLINDER HEAD FORGINGS formerly caused Alcoa packaging engineers much trouble because they shifted on pallets during movement. Three-layer unit load, containing 48 forgings provides complete protection because of uniform tension of six bands around unit. Plywood cover provides a work platform for tool.

Alcoa finds that uniform tension of strapping is key to . . .

Unitization of Irregular Shapes



AIRCRAFT CRANKCASES, in two stacks of 14 each, are strapped to pallet to form a solid unit load. Again, it is the equality of tension on all four straps which insures stability and safe handling of load.

Shifting, within unit loads of forgings, was once a chronic headache for packaging men at Aluminum Co. of America, has been eliminated by a fresh approach to unitization. In the past, aluminum forgings for aircraft engine manufacturers were too often damaged when binding material loosened under the strain of travel. Re-arrangement of top-heavy loads to prevent accidents was a costly and time-consuming task. It brought complaints from Alcoa's customers and carriers.

Several possible solutions were investigated. One, requiring the use of 1¼-inch strapping to hold the load, was vetoed because of high shipping costs which would have resulted. What was needed was a way of keeping loads secure under uniform tension.

The method finally adopted is based upon a standard system of unitization. Each type of forging is now shipped in a unit load which is able to withstand the varied stresses of handling and transportation. Correct tension on every strap, a vital factor in the success of the new method, is insured through the use of an electric skid magazine tool. Loads are bound with ¾-inch by .023 strapping which is fed from a reel through the power tool.

(Continued on page 109)

Conveyor runs entire length of warehouse. Crated transformers are picked off at assigned warehouse spaces by fingerlift trucks.

One-a-minute packing, zero

General Electric Transformers in General Engineered Wirebounds
...highlights of advantages

...in packing—One-a-minute packing with interlocking wrap around mat and Rock fastener closure.

Containers stored knocked down and outdoors! Only 15 crate sizes needed, compared with former 60 sizes, to pack 700 different transformers. Need for pallets eliminated. Customer can use fork trucks, and fast, easy unpacking of wirebounds saves customer time and money, too.

...in handling and warehousing—Construction permits handling by fork truck, fingerlift truck and overhead crane; permits conveyorized packing and handling, mechanized loading and unloading. Strength permits safe high stacking.

...in shipping—Zero product damage testifies to product protection. Tare weight substantially reduced from former package, and 336 crated transformers loaded per average car compared with former 200.

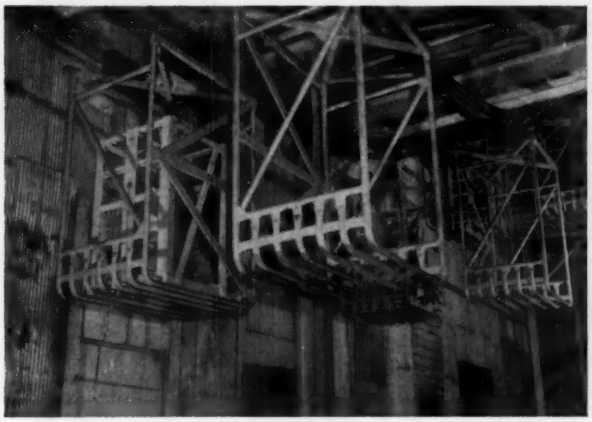
...in total—Six-figure dollar savings... 100% increase in usable storage space...30% over-all savings in packing costs—all are the result of cooperation between General Electric warehousing and shipping supervisors and General Box container engineers.

Basket conveyor carries knocked-down crates from crate storage area to transformer packing line. (All photos courtesy General Electric.)

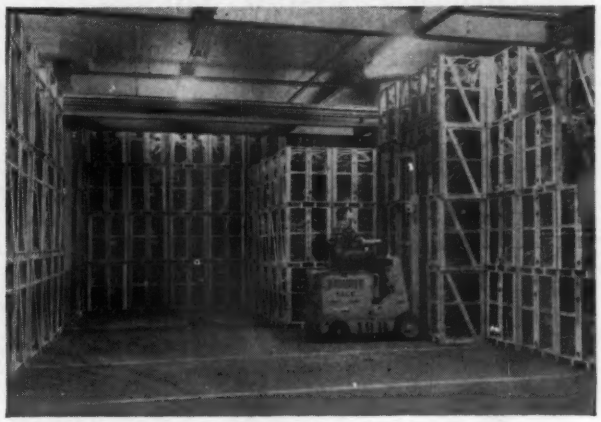
Polyethylene bag is slipped over transformer while it travels down conveyor on crate base. Bag can be used with merchandising imprint.

Interlocking mat section is wrapped around base and top. Rock fasteners are quickly secured. Semi-automatic closing is likely future development.

Crated transformers arrive at warehouse, are automatically unloaded from overhead conveyor baskets onto warehouse conveyor.



From one to four crated transformers are carried at a time from conveyor to assigned space by fingerlift truck, are stacked up to four high.



product damage for 1,000-lb. transformers!

From its plants in Pittsfield (where these pictures were taken) and Holyoke, Mass., General Electric ships as many as 15 carloads of transformers a day to utilities all over the country.

The pictures and captions tell how it's done... the panel lists most of the advantages gained from the methods and the containers used in doing it this way.

Your plant, your product, your problems are different. But—how long since you took a long look with new eyes at your containers, your methods?

General Box container engineers and two superb container laboratories are available to help you do this. And you'll never know how big the return can be until it's done. The first step is easy. Just let us send a man. Why not write now?

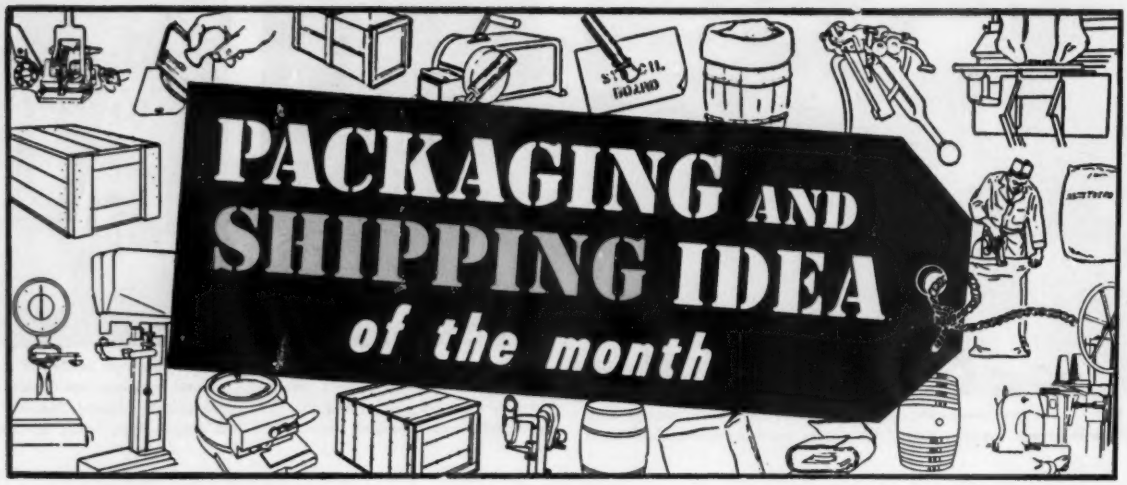
Factories: Cincinnati; Denville, N. J.; East St. Louis; Detroit; Kansas City; Louisville; Milwaukee; Sheboygan; Winchendon, Mass.; General Box Company of Mississippi, Meridian, Miss.; Continental Box Company, Inc., Houston

Engineered Containers for Every Shipping Need
• Wirebound Crates and Boxes • Generalift Pallet Boxes • Corrugated Boxes • Cleated Corrugated Boxes • Stitched Panel Crates
All-Bound Boxes

General Box

1847 Miner Street, Des Plaines, Ill.

★ ★ ★ ★ ★



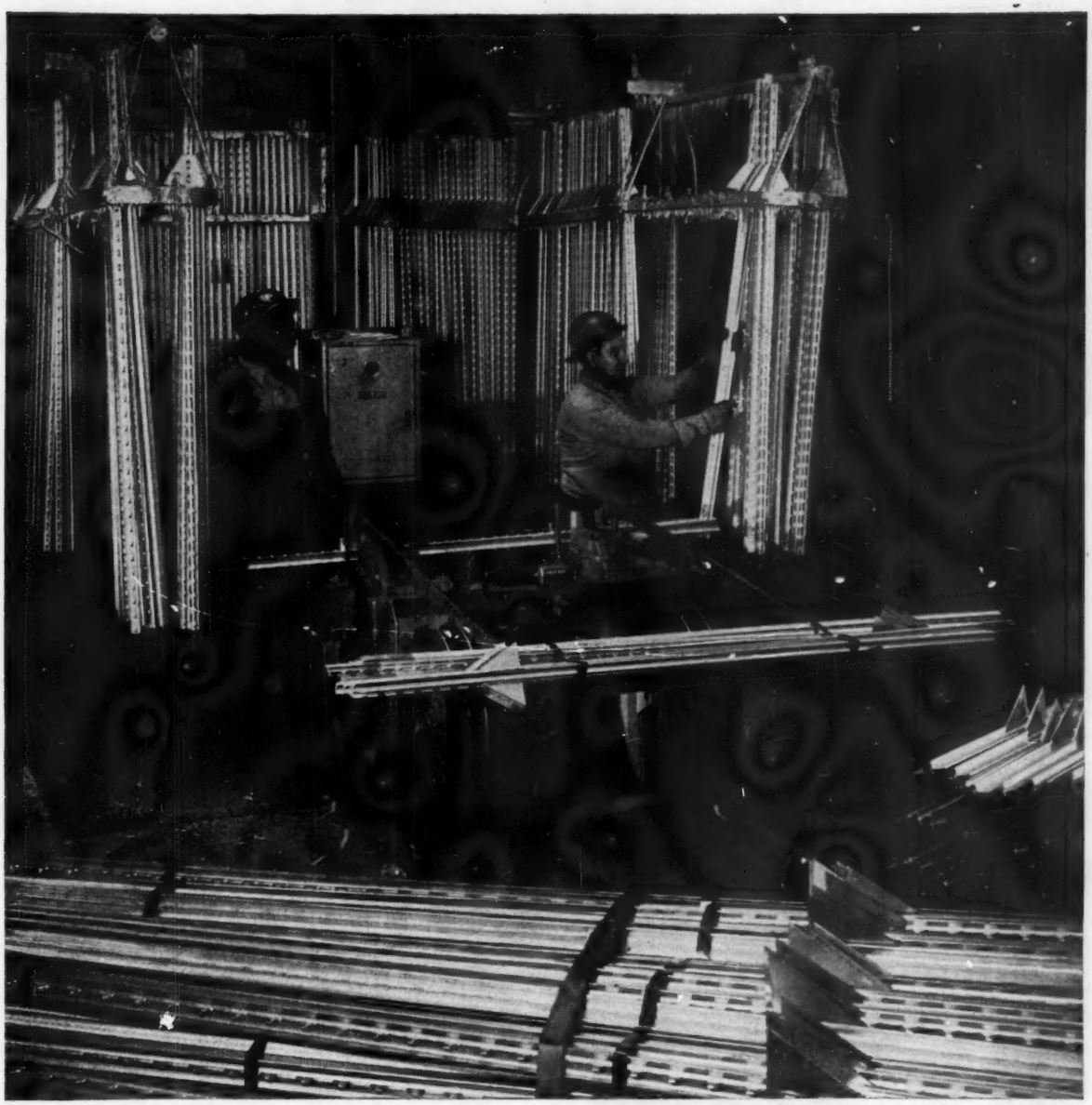
Full Size Visual Aid . . .

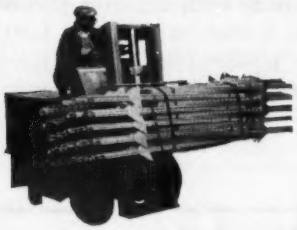
Box Car with "Glass" Side

IF YOU set a 5000-pound lathe inside a freight car, resting it on a wooden track of 4 x 4's so it has freedom of movement, and bump the car against another at an impact rate of five mph, the lathe will move 4½ inches. If the impact rate is six mph, the lathe will slide 11 inches. If the rate is nine mph, the movement is 55 inches. But if the speed at time of impact is only four mph, the lathe will not move at all.

This is the type of information which was developed by the Southern Pacific Railroad in a year of tests with its "teleview car", a normal freight car with one entire side made of transparent plexiglass. Through the transparent side, observers may watch load shifting caused by various speeds of coupling to the car. On the plexiglass side of the car is mounted a dial which shows speed, from one to 15 miles per hour, of the car at the instant of impact. It freezes at the moment of impact to permit exact determination of speeds. An indicator flashes green if the impact is below four mph and red if it is over six mph.

As part of Southern Pacific's continuing effort to reduce damage to freight shipments on its lines, the tests have been made before audiences of switchyard crews and other interested people, at various places in the Southern Pacific system, to educate them to the danger of damage if impact in switching is excessive.





Power does the hustling

These Signode power strapping machines put two straps around a bundle of steel fence posts in four seconds, complete. Then 50 or so small bundles are stacked and hand-strapped to make a big 4000-pound bundle. Over-all strapping time is four times faster than the former tying method. Bundles are tighter, neater—stay tight to destination. Total cost of all the steel strapping in each big bundle is only about a dollar—the whole package material cost! You can't beat the speed, strength and low cost of Signode steel strapping for tying things together. To make your product cost less to handle, store, ship and receive, see your Signode man, or write:

SIGNODE STEEL STRAPPING CO.

2618 N. Western Avenue, Chicago 47, Illinois

Offices Coast to Coast. Foreign Subsidiaries and Distributors World-Wide

In Canada: Canadian Steel Strapping Co., Ltd., Montreal • Toronto

Circle No. 143 on Reader Service Card for more information

VERSATILE

Almost any kind of materials-storage problem can be solved with fir plywood. Here, economical sheathing grade plywood was used for easy-to-build bins which can be filled from the top and permit scooping at the bottom. Fir plywood bins can be fabricated in any woodworking shop to meet exact space and use requirements. The strength, rigidity and durability of the panels means minimum maintenance.

DURABLE

Fir plywood is an ideal material for all types of tanks. The durability of overlaid Exterior-type fir plywood (made with 100% waterproof glue) is dramatically demonstrated by this use aboard a fishing boat. The salt-brine well holds 25,000 pounds of fish, was built to replace a metal refrigerated ice pack—at a saving of about 75%, including the cost of the compressor to keep the brine at 30°. Another advantage: no electrolysis problem, because of the wood construction.

LOW COST

A 20% saving in material plus additional 40% reduction in time and labor costs was realized by Lyon Van & Storage Company's Export Division, Burbank, California, in the construction of fir plywood shipping containers. Shown are guided missile component crates, made with Exterior plywood: ⅜-inch on the sides, ½-inch on the top, 1-inch on the bottom. Motion picture cameras and aircraft instruments are other items shipped by Lyon in fir plywood containers.

DFPA TESTED QUALITY

FIR PLYWOOD

means quality construction

FOR MORE INFORMATION about uses shown above, design and/or specification data, mail coupon ——→

Circle 46 on Reader Service Card for more information

1. SPECIFY BY DFPA QUALITY TRADEMARKS

DFPA grade-trademarks appear only on plywood manufactured, inspected and scientifically tested under the DFPA quality control program. DFPA, Douglas Fir Plywood Association, is a non-profit industry organization devoted to product research, promotion and quality maintenance.

2. CHOOSE THE RIGHT GRADE FOR EACH JOB

Fir plywood comes in two types: 1. *Exterior* (waterproof glue for permanent exposure to water or weather); 2. *Interior* (moisture-resistant glue) for indoor uses, crating, sheathing, maintenance. Within each type are several grades – i.e., panels with one good side, two good sides. Most popular grades are shown below.

EXT-DFPA — Exterior plywood for permanent outdoor uses

PlyPanel® for paneling, most indoor uses

PlyScord® is unsanded panel for sheathing, crating, bins, etc.

PlyForm® concrete form grades come in Exterior and Interior types.

SPECIALTY PANELS include 1. *Overlaid Exterior plywood* (hard, smooth, abrasion-resistant fused resin-fiber surfaces) for siding, signs, tanks, concrete forms; 2. *Textured panels* with smart grooved, brushed or striated surfaces for fixtures, siding, special decorative effects.

DOUGLAS FIR PLYWOOD ASSOCIATION
Tacoma 2, Wash. (Good USA Only) Dept. 190
☐ Please send basic fir plywood specification data.
☐ Also send information about use of fir plywood
for.....
Name_____
Firm_____
Address_____
City_____ Zone____ State____

IRREGULAR SHAPES . . .

(*Continued from page* 103)

Cylinder head forgings, made for a large eastern manufacturer of air-cooled radial aircraft engines, had been particularly troublesome, because of their irregular shapes. In the new packaging method, 16 of the forgings are placed on a pallet. Two more layers, placed over the bottom one, are separated by plywood spacers.

Plywood Cover Used

A plywood cover is placed over the top layer and six vertical bands are tensioned around the entire load. The cover, incidentally, provides a convenient work platform for the electric strapping tool. The dimension of each pallet is 48 inches by 48 inches. Gross weight of a complete load of cylinder head forgings is approximately 3250 pounds. (Each forging weighs approximately 65 pounds.) Although all four sides of the unit load are open, forgings have no tendency to shift or fall out. They are securely retained in place by the uniform pressure of the strapping around the load.

Another hard-to-ship forging was an aircraft crankcase. The strapped unit load which solved that problem is made up of two stacks of 14 crankcases. Four bands of strapping are criss-crossed over the entire load. Tensioning, sealing and cutting of the bands is accomplished with the electric skid magazine tool in a vertical position.

To study the efficiency of the new loads, a number of test shipments were made. Loads of forgings which had been strapped with the electric power tools were followed in transit. Each load was studied at every transfer point, including Alcoa's shipping platform, the carrier's transfer dock and the customer's receiving department. It was found that the method worked to the complete satisfaction of everyone who handled the loads.

Photographs through the courtesy of Stanley Steel Strapping, Division of the Stanley Works.

FOR lower production costs . . . stronger, neater closures . . . ability to get out rush orders in a hurry, you can't beat Union Special Bag Closing Machines! Specially built to stand up under heavy production schedules, these machines provide the high output rates needed to meet modern competitive conditions.

In the Union Special line, it's easy to find the right unit to meet your requirements. ASK FOR RECOMMENDATIONS.

SEND FOR THIS BULLETIN!

It's easy to find just the right unit to meet your individual needs in Union Special's big line of bag closing machines. Ask for a copy of Bulletin No. 200, "UNION SPECIAL FILLED BAG CLOSING MACHINES."

Union Special®
MACHINE COMPANY

415 N. FRANKLIN ST., CHICAGO 10, ILL.
Circle 160 on Reader Service Card

NYLON STAPLE, a soft and resilient material is baled directly into shipping containers at the Covington, Va. plant of Industrial Rayon Corp. After an initial compression into bottom section of the shipping container, a telescoping top is set in place (above) and pressure is again applied. While bale is still under compression (below), vertical bands are tensioned.

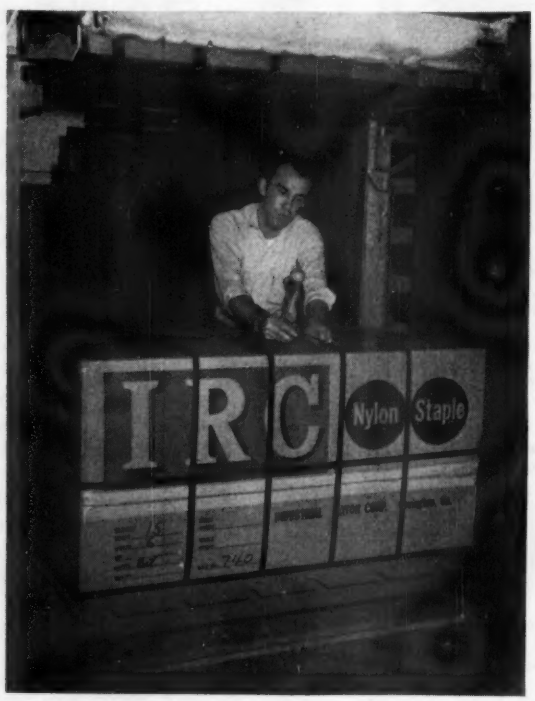
An extension of good handling...

Simultaneous

GOOD handling can be wasted. Informed managements recognize that benefits derived from efficient handling procedures in the production phases can be quickly offset by un-coordinated, slow methods of preparing finished products for shipment.

At the new Nylon Staple Fiber Plant of Industrial Rayon Corp., at Covington, Va., there is little chance for packaging activities to absorb benefits gained through good handling in other departments. In an almost automatic operation, nylon staple fiber, used primarily for high-quality floor coverings, is baled into steel strapped corrugated containers. The resulting packages are easily handled by fork truck and safely stacked to ceiling heights in the warehouse.

The resilient nylon material travels from the last manufacturing operations via pneumatic conveyor



Baling and Packaging

to a hopper positioned directly over a chain operated baler. The baler has a pit extending 14 feet below floor level. With the doors of the baler closed and the bottom platen, at its lowest point in the pit, there is provided a 20-foot-deep chamber into which to deposit the nylon staple for baling.

In a few quick steps, the 20-foot load in the chamber is compressed into a bale measuring only 33 inches high and weighing approximately 400 pounds.

Those steps are:

1. Doors of the baler are opened and the lower section of a telescoping corrugated box is placed on the bottom platen.

2. As the heavy doors are closed, the platen is lowered to the bottom of the pit, 14 feet below floor level.

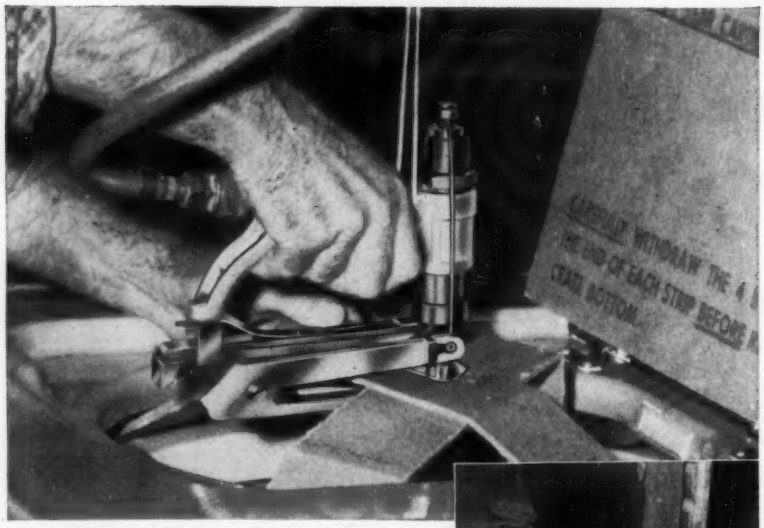
3. Loading of the staple into the chamber is from the hopper mounted atop the baler. When the chamber is full, pressure is applied, then entirely released. That permits the staple to retract into the chamber. Then the doors are opened.

4. With the doors open a telescoping cover is placed over the staple. With the cover in place, the doors are closed once more and pressure is again applied. This time, it is not released until the bale has been completed. The doors are opened and, through slots in the top and bottom platens of the baler, vertical steel bands are slipped around the bale.

6. The ram pressure is released, the bale is turned 90 degrees, and a horizontal band is applied around the completed bale. The result is one of the neatest nylon staple bales you will see anywhere, ready to be transported to storage by fork truck.

HORIZONTAL BAND and a final vertical band are tensioned around bale after it has been turned onto one side. The result is an extremely neat pack (left).

FORK TRUCK picks up completed bale and transports it to storage. The bale, which weighs about 400 pounds, can be stacked several high.



1 **Staple corrugated "bridging"** easier with portable DUO-FAST Air Pliers. Handy, trigger-fired tool saves time . . . you take the tool to the work, instead of moving the work to the tool.

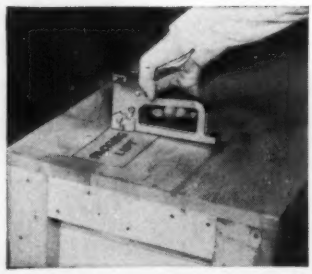
2 **Line boxcars faster** with a handy DUO-FAST Hammer Tacker. Speedy one-hand tool drives staples as fast as you swing it. Shippers and railroads agree . . . it's the best and easiest method.

3 more ways to save on packing with DUO-FAST automatic stapling

Shown here are 3 of the ways DUO-FAST Automatic Stapling can reduce shipping costs for you. There are many more.

Check your DUO-FAST man today. With over 150 Staple-tacking models to offer, he can show you the safe, accurate, *automatic* way to streamline your fastening methods.

Free maintenance. And remember: DUO-FAST Staplers carry a money-saving Free Service Guarantee. Send coupon below for free "Timesavers" bulletin FT-50.

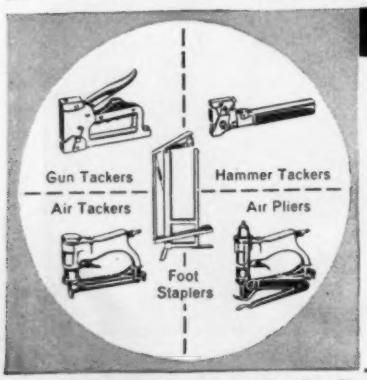


3 **Attach tags and labels** the easy way with this versatile DUO-FAST Gun Tacker. You just compress the handle . . . staple drives quickly, neatly, securely. A great all-purpose tool.

DUO-FAST

Staplers · Tackers · Staples

7405



New Ideas for you!

FASTENER CORPORATION
356-58 Fletcher, Chicago 14, Ill.

Without cost or obligation, please:

☐ send DUO-FAST Bulletin FT-50, "Timesavers for Shipping Departments."

☐ have a DUO-FAST man call on us.

Name_____

Firm_____

Address_____

City_____ Zone____ State_____

Circle No. 55 on Reader Service Card for more information

SALES FIELD . . .

(Continued from page 22)

Robert L. Brown and Charles E. Howard have assumed new sales posts in the Yale Material Handling Division of The Yale & Towne Manufacturing Company.

R. L. Brown

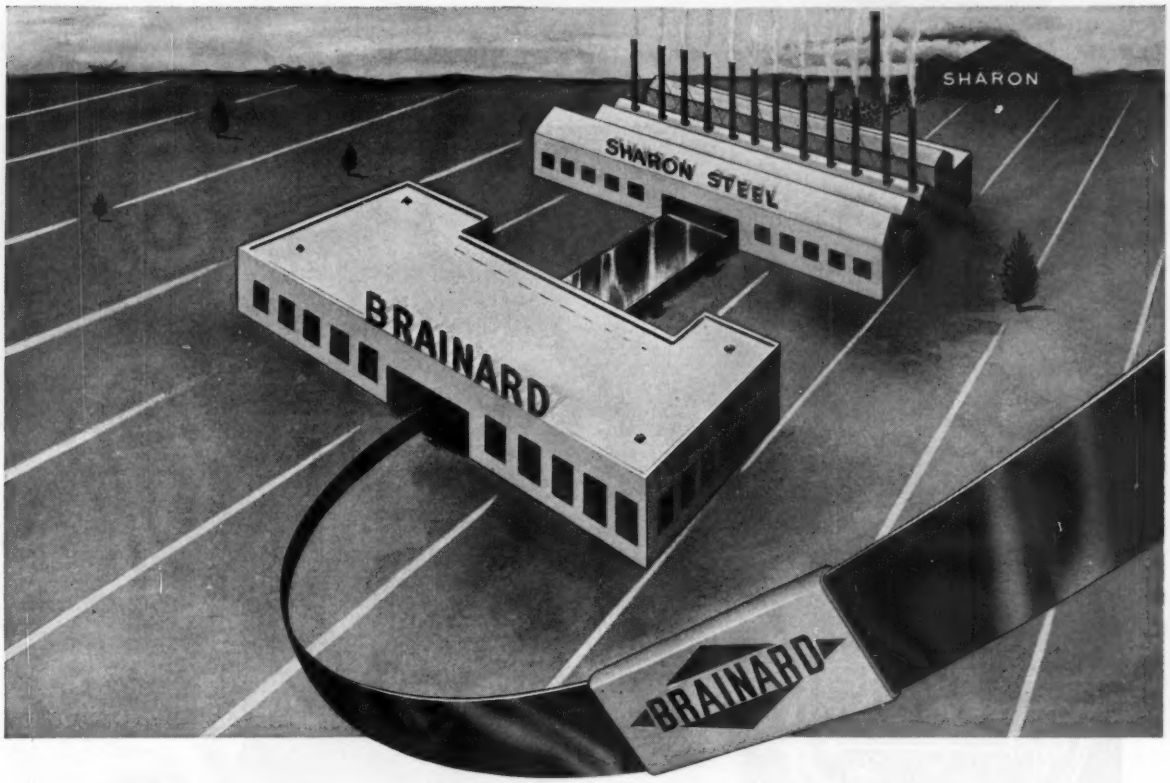
C. E. Howard

Brown has been named sales manager of gasoline and LP-Gas industrial trucks. He was previously manager of electric truck sales. Howard becomes sales manager for electric powered trucks and truck attachments. He had formerly been manager of attachment sales for the Division. The promotions were announced by **Clyde R. Dean,** general sales manager of the Division.

New industrial engine dealers for the states of New Jersey and Kentucky have been announced by **Chrysler Corporation's Marine and Industrial Engine Division. Engines & Parts, Inc.,** located in Bergen County, is the new appointee in New Jersey. **Cardinal Carryor Company, Inc.,** Louisville, Kentucky, has been assigned in that area.

A new company has recently been formed in Chicago, Ill., to specialize solely in containerization, consultation and sales engineering of material handling containers. Called **Thornell Associates,** the firm is under joint partnership of **Garth Owen** and **Carl Thorkelson.** It is concerned with assisting the customer in determining what type of industrial container is best suited for the handling, storage and/or shipping of manufactured products.

Another Plus... from Brainard



"INTEGRATION" An Extra Assurance of Quality in Brainard Steel Strapping . . .

The word integration has a special meaning in the industrial vocabulary. An integrated company has come to mean one that gives something extra in quality, delivery, and performance.

As a division of Sharon Steel, Brainard can be sure that the steel used for strapping has been developed to meet their own exacting standards. From mine to finished product, Brainard Steel Strapping has that extra quality that can come only from an integrated industry.

The Brainard strapping line includes over 378 items to provide you the finest modern strapping facilities. Brainard trained sales engineers are on call in every major city to help you with your strapping problems.

Brainard Steel Strapping

SHARONSTEEL

Brainard Steel Division, Sharon Steel Corporation
Griswold Street, Warren, Ohio

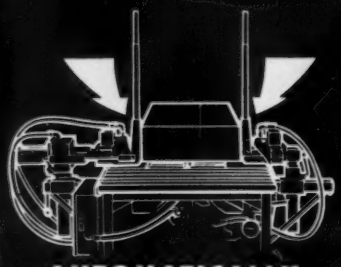
305

Circle No. 25 on Reader Service Card for more information

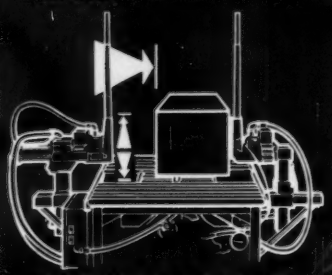
The Age of Automation comes to carton-closing

see the new

International TWIN-END STAPLER IN ACTION!

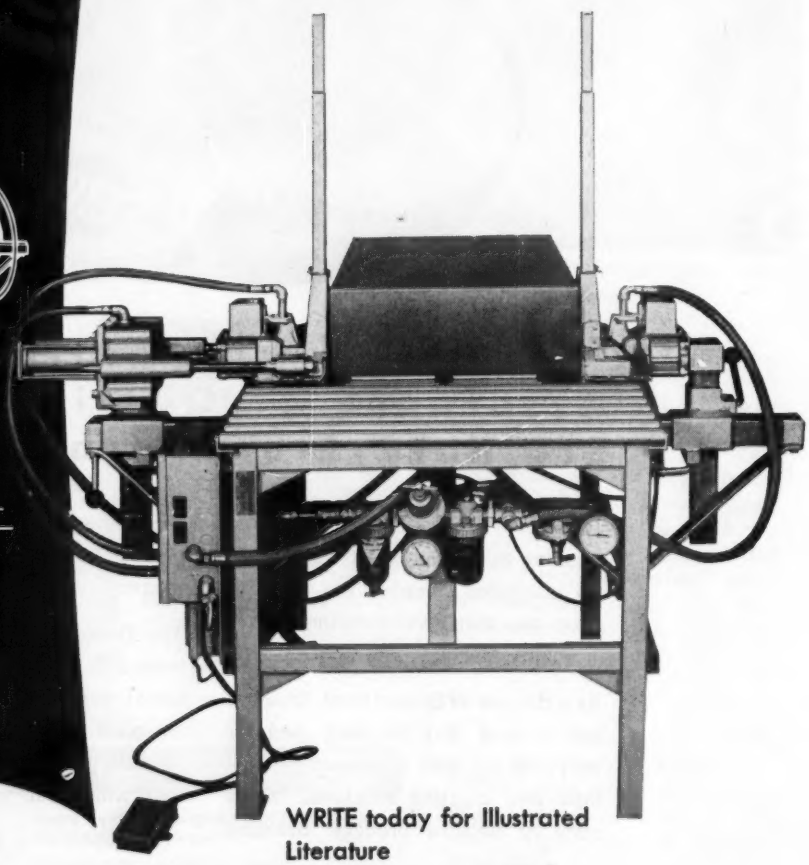


AUTOMATICALLY
closes *both* ends of carton at the same time—after it's filled!—up to 1000 cartons per hour.



AUTOMATICALLY
adjusts to a wide variety of carton sizes and shapes! Stapling heads adjust for height; width of carton adjustment is automatic.

AUTOMATICALLY
powered by air and electric, for fast, effortless operation!



WRITE today for Illustrated Literature

INTERNATIONAL Gold Crown

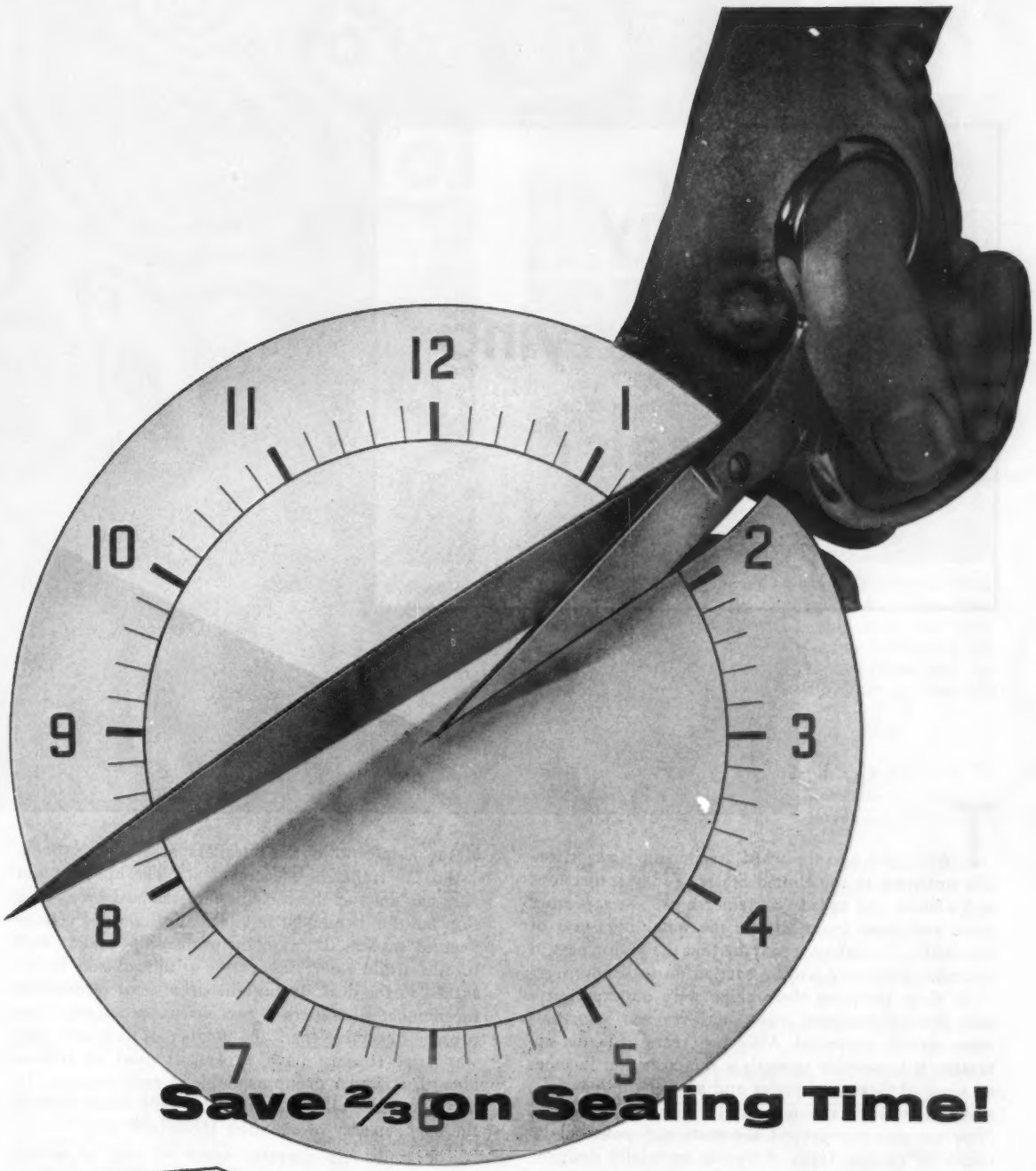
International Staplers

INTERNATIONAL STAPLE & MACHINE COMPANY

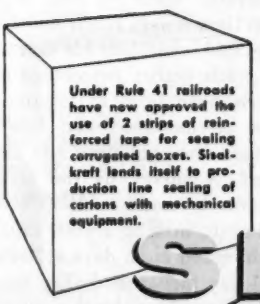
Originators of Carton Closing Staplers

800 E. HERRIN STREET • HERRIN, ILLINOIS

Circle No. 80 on Reader Service Card for more information



Save ⅔ on Sealing Time!


Under Rule 41 railroads have now approved the use of 2 strips of reinforced tape for sealing corrugated boxes. Sisalkraft lends itself to production line sealing of cartons with mechanical equipment.

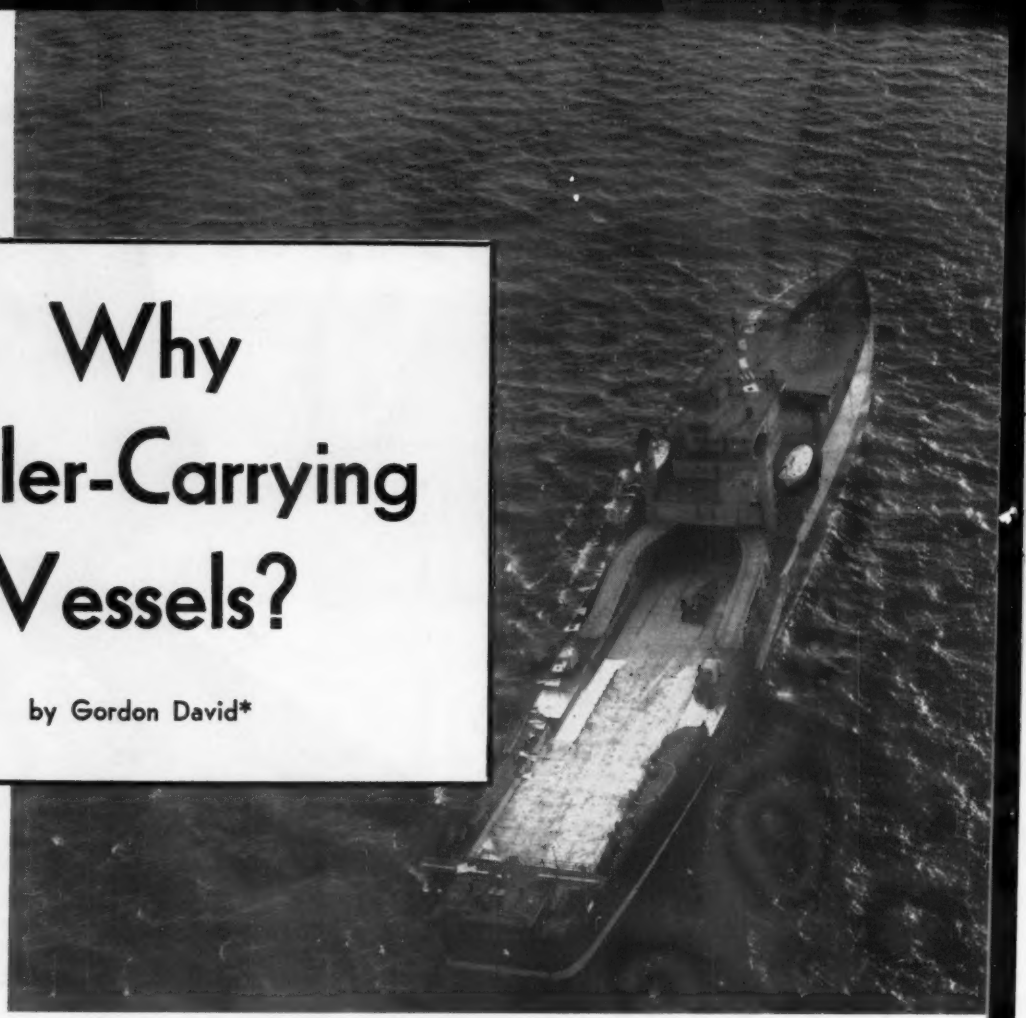
With 2-way reinforced Sisalkraft Sealing Tape you automatically save two-thirds the time on every carton sealing job. Yes, and you save tape and labor as well as time. Write to us for more facts about Sisalkraft reinforced tape and nearest source of supply. American Sisalkraft Corporation, Attleboro, Massachusetts. Makers of sealing tape stock for the Gummed Paper Industry.

SISALKRAFT
Reinforced **SEALING TAPE**

Circle No. 10 on Reader Service Card for more information

Why Trailer-Carrying Vessels?

by Gordon David*



TWO years ago the word "trailership" was virtually unknown in the United States. Today trailerships and a sister type called "containerships" are appearing more and more frequently on the water highways of the world. Tomorrow it may be that the major part of seaborne commerce will be carried on trailerships.

At their inception these ships were an experiment and their operational costs and revenue potentials were entirely projected. After two years of actual operation it is possible to analyze the costs and incomes of some of these enterprises and answer the questions raised as to their economic and technical practicality. Now we also can project the costs and potential incomes of various types of vessels especially designed and constructed for this new method of carrying freight.

What are the advantages from the shipper's standpoint? The shipper saves export packing charges because trailership freight needs no special packing. He saves freight charges on the packing he does not use, his shipment is handled the minimum number of times, wharfage and dockage charges are minimized, pilferage and breakage are almost nil. Because of the trailership's flexibility of loading, last minute shipments can be put aboard. Trailership operators may offer not only free cargo insurance, including the inland freight, but they may issue on-board bills of lading on receipt of the shipment in their trailers at shipper's dock.

But are trailerships economical? The operator not only has most of the costs of the standard break-bulk ship but the investment in and maintenance of a large fleet of trailers. Because the trailership cannot wait for the trailers carrying cargo to unload and be returned to the dock, it must tie up at least three times the number of trailers it can carry, for a period approximating three times the number of days of a one-way trip. It must have a capacity load of trailers aboard, a similar group available at each terminal. In addition, the trailership can carry only about 50% of the bale capacity of a similar break-bulk ship.

The trailership operator saves on cost in several ways. First, his in-port time is very much less than that of the break-bulk ship, and conversely his time enroute with a payload is a much higher percentage of total time. Loading methods have been so improved that cargo (trailers) can be unloaded and new cargo loaded in less time than the ship itself can be made ready to turn around. A survey by the Society of American Naval Architects made in 1955 showed a moderate size coastal craft, making a 1600 mile round trip at 12 knots, would spend eight days at sea and 16 days in port for a 24 day turnaround. The same ship converted to trailer use would make the same round trip in nine days. It would make eight trips to every

Low-cost marking attachments

TRAILERSHIPS like the S. S. Carib Queen (left) promise great savings for shippers by reducing handling and warehousing at loading points and by cutting port time to a fraction of that presently needed to unload and reload. Portable side ramp (above) is used for loading trailers onto upper trailer deck of the ship.

TIME REQUIRED for unloading and reloading of trailers on trailership can be accomplished in less time than it requires to prepare the ship itself for turnaround. A similar method of shipping (containership) uses bulk containers instead of trailers. Cost and income of containerships vary little from trailerships.

three made by the unconverted break-bulk ship. In addition the per-ton cost of loading and unloading would be reduced by at least 75%.

The trailership saves in other ways. As its freight comes to it pre-loaded in trailers or can be loaded into trailers at a convenient point removed from the dock area, the trailership does not require expensive warehouse facilities at its loading point.

A research organization recently completed an evaluation of trailership operation compared to that of a conventional C-3 vessel. The C-3 is a standard 16 knot freight ship of about 10,000 deadweight tons, or 14,450 tons expressed in measurement tons of 40 cubic feet each.

Table A basic data were used in cost calculations. Standard ship costs were used in this table, and the trailership used as a yardstick was the newly-completed CARIB QUEEN of TMT Trailer Ferry.

The per-ton calculations were arrived at via the cost and percentage breakdown analysis as listed in Table B.

Assuming these figures to be correct, the trailership presents a considerable savings over the convention break-bulk ship, even at the trailership's present

TABLE A

	Conventional C-3	*Trailership*
Round-trip distance, miles	7000	7000
Speed of vessel, knots	16.0	15.0
Round-trip sea time, days	18.2	19.4
Round-trip port time, days	20.0	2.0
TOTAL ROUND-TRIP TIME, DAYS	38.2	21.4
Days in service per year	350	330
Round trips per year	9.16	15.4
Measurement tons (MT) cargo/one-way trip	14450	4650
Measurement tons cargo per year	265,000	143,220
TOTAL COST PER MEASUREMENT TON	$19.84	$12.87

TABLE B

	C-3		*Trailership*	
	% $ per MT		*% $ per MT*	
Wages and Subsistance	6.5	1.30	15.2	1.96
Stores and Supplies	1.2	.24	2.2	.28
Insurance	3.3	.65	8.3	1.05
Amortization and Interest	8.1	1.60	14.9	1.92
Fuel	4.5	.90	16.6	2.13
Repairs	1.7	.32	3.0	.39
Terminal	4.9	.96	16.9	2.17
Stevedore	67.9	13.50	2.5	.32
Trailer	—	—	15.0	1.93
Administration	1.9	.37	5.4	.70
	100%	$19.84	100%	$12.85

Save Money

BY PROTECTING THE END-BOARDS OF YOUR PRESENT PALLETS

U. S. PAT. 2297347

PALLET GUARD
by TIER-RACK

YOU CAN STOP HIGH MAINTENANCE COSTS, PROLONG PALLET LIFE. Pallet Guards are a "bumper" of sturdy steel tubing that you can *install yourself* on your *present pallets*, or specify on your next purchase of new pallets. They provide lasting protection for the end boards of wooden pallets by eliminating most of the causes of wooden pallet failure. Available in six models to fit every type of wooden pallet. Try a few Pallet Guards and *convince yourself* of the great savings!

Write for Literature

TIER-RACK
TRADEMARK REGISTERED
PALLET GUARDS

TIER-RACK CORPORATION, 122 North Seventh Street, St. Louis 1, Mo.

TIER-RACK MANUFACTURES THE TIER-RACK PALLET STACKING FRAMES

Tier-Rack Corp.
10100 Fullerton Bldg. Date .....
St. Louis 1, Mo.

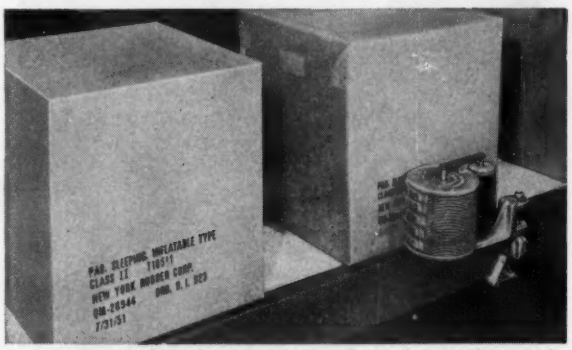
Please send complete details about Pallet Guards.

Company Name .....
Requested by ..... Title .....
Address .....
City and State .....

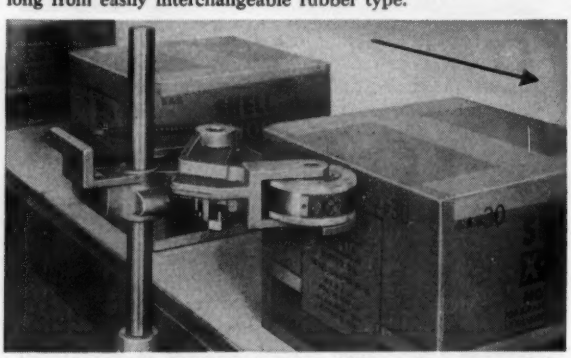
Circle 177 on Reader Service Card for more information

Low-cost marking attachments save thousands of $ every year

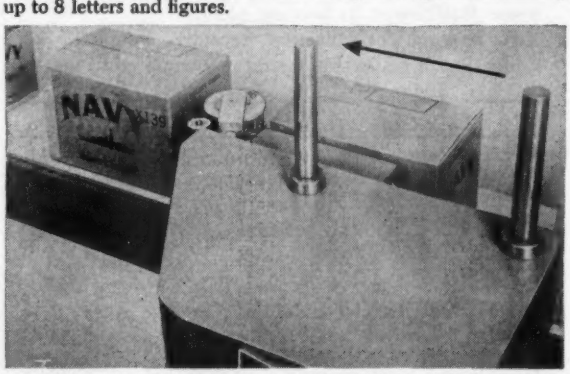
Compact ROLACODER machines mark 1, 2 or 4 sides of cartons, cases, drums, bags, etc. automatically



Friction-operated ROLACODER "100" machine makes single, accurate "spot" imprint of brand names, varieties, code-dates, lot numbers on one side of containers as they travel on conveyors or through case-sealer. Prints from 1 to 5 lines of copy up to 12" long from easily interchangeable rubber type.



Twin-action ROLACODER "500" marker marks codes and lot numbers on *front* and *one side panel* of cases simultaneously . . . in a single pass. Friction-operated . . . imprints legends containing up to 8 letters and figures.



Solenoid-activated twin-action ROLACODER "200" machine imprints codes and lot numbers on *rear* and one side panel (or rear only). When mounted in tandem with ROLACODER "500" machine, cases can be marked on all 4 sides simultaneously without requiring that they be turned.

Write for new Bulletin "ROL-2"

Gottscho **ADOLPH GOTTSCHO, INC.**
Dept. D, Hillside 5, N. J.

Automatic CODING, MARKING, IMPRINTING MACHINES

In Canada: RICHARDSON AGENCIES, LTD., Toronto & Montreal

Circle 64 on Reader Service Card for more information

state of evolution. After further experience trailership operators may possibly settle on a standard size, which could be about 450′ length, 75′ beam, 20′ draft, with 6000 diesel or steam horsepower, capable of carrying 120 35′ trailers, 75 automobiles and 2000 tons of liquid cargo at a consistant 18 knot speed. The amortization, insurance, wage, fuel and similar costs would be about the same as those shown in the table above, but the extra speed and carrying capacity based on the same method of calculation would reduce the per-MT cost to below $10.00, or about 50% of that of the conventional C-3.

This conclusion is important. It stresses the need for speed, for ships designed especially for the peculiarities of trailer loading, the advantage of short port time and other factors. It shows that conventional ships can be converted to profitable trailerships, but the newly designed and built ships will be more profitable.

Advantages of Containerships

The cost and income of the containership vary little from those of the trailership. Where the trailership rolls the loaded trailers on and off the ship, and to and from a marshalling yard, the containership cargo must be lifted on and off and her loading time is increased. The containership has about 25% more usable bale capacity than the trailership and represents a compromise between the extremely fast loading of the trailership and the extremely slow loading of the conventional ship. Recent developments by Waterman Steamship Corporation in initiating the conversion of four C-3 ships to vessels capable of carrying 108 35′ containers of 2000 cubic feet each, with each vessel equipped with special crane devices are most significant. It is claimed that these vessels can completely unload and load in 10 hours. This will bring the containership port time very close to that of a trailership. Although not as flexible in pickup and delivery service, with this shortened port time the containership will be able to complete with the trailership on any route.

Material Handling to Help Expansion

As the length of trip increases the economic picture changes somewhat. A survey made in 1956 by the National Academy of Sciences indicated that at some geographical point the advantages gained by the quicker turn-around, lower port costs and low per-trip overhead costs by the trailership are overcome by the greater bale capacity of the break-bulk ship. The survey showed that this point is about 4500 miles from the starting point of the trip and that on a 9000 mile round trip the conventional vessel's greater capacity for freight equalizes the advantages of the trailership, and that at longer distances the break-bulk vessel is economically more feasible. The survey seems accurate on today's efficiency rating. However, it failed to take into account the extra weight capacity of the trailership, its ability to use this capacity for specialized liquid cargo, and made no allowance for increased efficiency in loading and stowing trailership cargoes.

It is reasonable to expect that as more use is made of the wonderful material handling devices now available, and more of the technical problems inherent in any new type of operation are overcome, that the fixed geographical limit set by the National Academy of Sciences will become invalid. Many observers believe that within the next few years a large percentage of overseas and coastwise freight will move in containers or trailers, and that this method of transportation will almost completely supplant the break-bulk carrier for all but the lowest rate commodities.

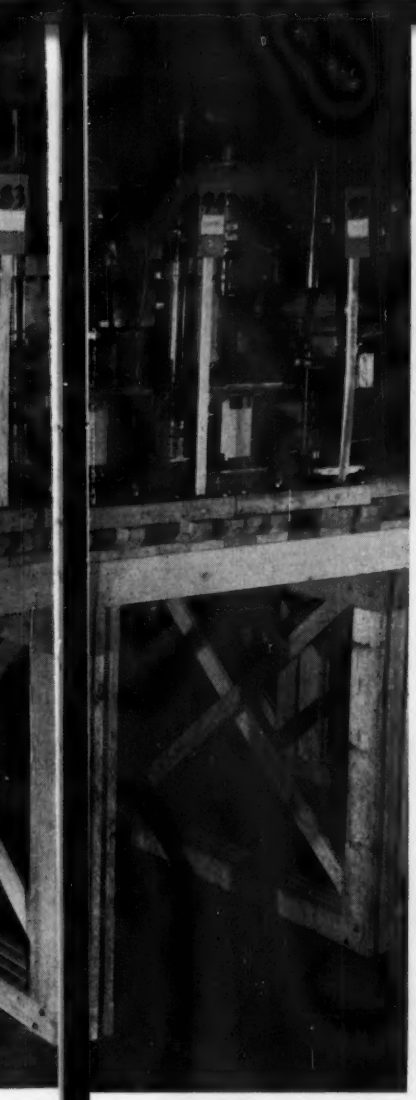
**Gordon David, Transportation Specialist, has been associated with marine and motor transport since 1929. He was a pioneer in the first roll-on/roll off operations in the United States, in the Lake Erie region. Important positions which he has held in the transportation industry include: Superintendent of Motor Transport at Plum Brook Ordnance Works; General Manager of Nantucket Boat, Inc.; organizer and General Manager of Searoad Transport Co.; Marine Director of TMT Trailer Ferry, Inc. David is now in the consultant field, specializing in roll-on and containerization problems.*

MASTER WAREHOUSE LIST is checked against warehouse floor-plan by Noble W. Jones (top, inset). Templates corresponding to every skid of equipment were used in establishing the storage "master plan". Scale, 1" = 10'.

This paper was the first prize winner in a contest sponsored by the Southern California Division of the Society of Industrial Packaging and Material Handling Engineers. For his outstanding entry Jones was awarded a cash prize of $100 and a certificate of excellence.

Second prize in the contest was won by Robert Gillis, North American Aviation, Inc., Engineering Division. For his paper on "The Mobile Packaging Concept", Gillis received a Certificate of excellence and an engraved plaque.

Judges were: Ken Brown, Ramo-Wooldridge Corp.; Prof. John Huffman, U.C.L.A.; Dr. Lawrence R. Guild. U. S. C. The contest and an awards dinner on March 4th were under the guidance of the Division's education committee which is made up of the following: David C. Pritchard, Lockheed Missile Systems Division; Dave Nunn, Lockheed Aircraft Corp., Harold Kilmer, North American Aviation, Inc.; Ned Christensen, Key Container Corp.



DEHUMIDIFIED STORAGE hutment at Los Angeles District Ordnance Warehouse has benefited from module decking. To protect against corrosion of precision equipment with critical surfaces roof structure is a moisture vapor-proof cocoon-like structure. Sealed doors lead into the storage area.

Pre-Planned Module Decking Increases Capacity 50%

by Noble W. Jones
Bekins Industrial Packaging Div.
Bekins Van & Storage Co.

MODULE decking . . . storage preplanned by templates . . . a master plan for material storage, access and withdrawls are the ingredients which guarantee success of a spacial concept we have applied to warehousing. The concept has increased storage capacity 50 per cent at the Los Angeles Ordnance warehouse at Wilmington, Calif. It has virtually pioneered a new method for industrial storage.

Advantages of the spacial concept are: (1) Another "floor" is added to the warehouse via module tiers— standardized 6 x 6 x 6-foot prefabricated deck sections which are both reusable and removable; (2) All but the main aisles are eliminated. Machine-mounted skids can be placed side-by-side since, by this method, skid identification goes aerial via eye-level placards mounted on each skid; (3) Through the use of exact scale templates, material placement is accurately pre-planned. The object is to group together in the smallest possible space all machinery needed to produce a specific end item.

The Problem

Because warehouses were full to overflowing, our choice of operation was between two possibilities—increase capacity by at least 33 1/3 percent of recommend purchase or lease of additional space. Involved in these industrial storage projects are hundreds of precision machine tools and special equipment which are being laid away against the possibility of a national emergency, or held in storage pending disposition. As with non-military storage, our aim was to make stock withdrawal easy, assure maximum protection for delicate tools, utilize every inch of warehouse and reduce storage costs.

The warehousing operation is complex. Most buildings are about 600 x 600 feet, single-storied, with a 14-foot ceiling clearance. Generally, there is no second deck or mezzanine. Nor are the structures sufficiently heavy to allow construction of a second floor even if truss height permits. To further complicate matters, machine tool numbers are normally stenciled on skids as an aid to warehousemen.

How the Problem Was Approached

Some machine tools weigh upwards of 100,000 pounds and stand as high as 10 feet from the floor. Then, too, such machines as lathes and automatics—with their highly polished precision surfaces—require the protection of humidity control.

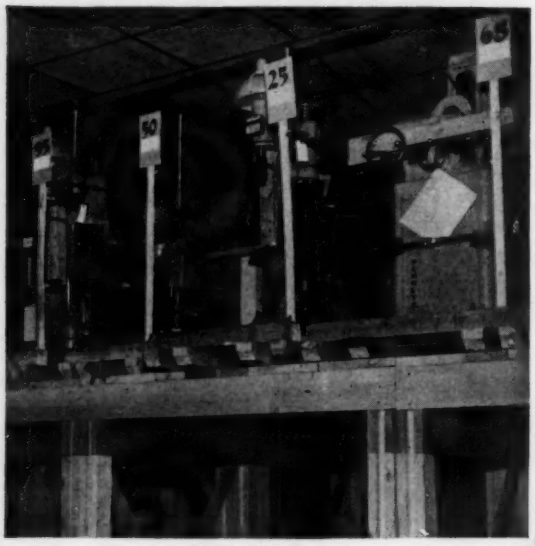
Bekins Packaging Research made a 30-day engineer-

Continued

ing survey which utilized information presented by the Los Angeles District Ordnance office. It had a threefold aim: (1) to decide which tools, by necessity, must be held to strict humidity control; (2) To make an exact scale template of every machine's skid so that skids could be pre-positioned on the warehouse floor, or assigned to a deck above the floor (here, machine weight was a big factor); (3) most important, to group together all tools by manufacturing sequence.

Engineers began by drawing up a comprehensive list of every machine either currently in the warehouse or scheduled for storage there. The list hewed to manufacturing rquirements. Suppose the warehouse was to lay away all machine tools needed to produce an aircraft 50-mm gun. In effect, then, a complete production line was involved. Evey machine tool, plating tank, industrial furnace and other units required in the manufacture of the end item, had to be brought into the picture. The list of tools which was drawn up was specialized to the end item. This procedure is recognized as part of the lay-away program of Ordnance. It is aimed at getting back into production within 30 to 60 days at the time of a war emergency.

With scores of end items listed (and under them the tools needed for their manufacture) the following plan was developed for simplifying tool identification. For the multi-digited serial number of each machine, there was substituted a three to four-digit warehouse locator number. With every tool assigned a simplified number, engineers laid out a template plot-plan.



MAXIMUM USE of warehouse space was made possible by module decking. Note eye-level placards mounted on each skid. Warehousemen can spot the cards easily from distances of more than 100 feet.

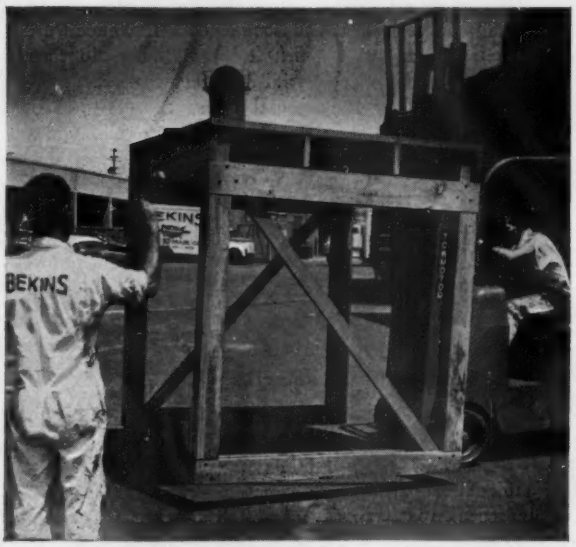
Template Layout

Plant engineers have long used exact-scale templates to pre-plan machine installations, figure aisle widths, compute utility runs. But this adaptation, for use in the pre-planning of warehousing of machine tools and industrial equipment, is a new concept.

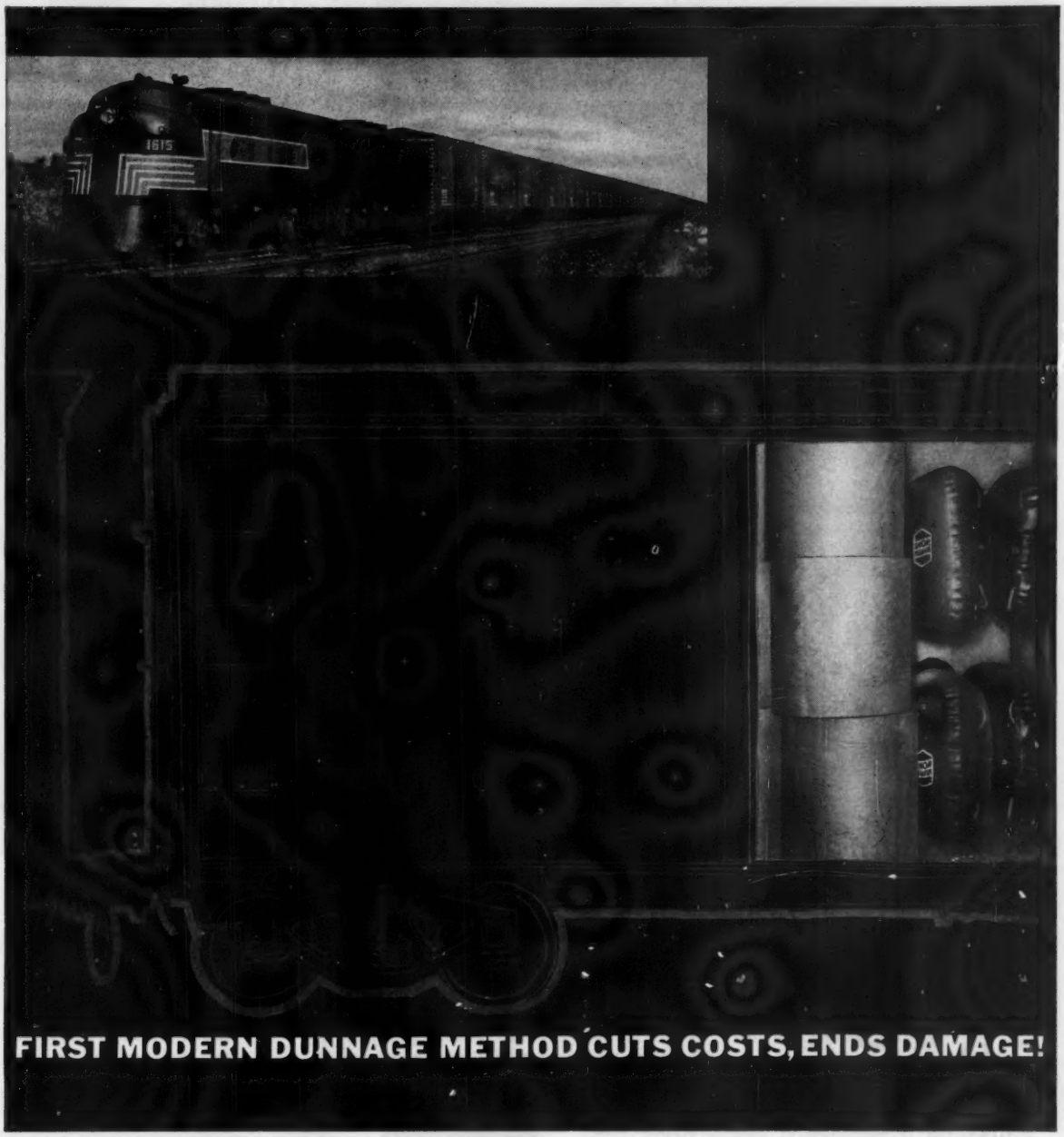
For every skid of equipment, a template was made. Scale was one inch to 10 feet. As a template was finished, it was given the number of the skid it represented. This was cross-indexed on the tool list, along with weight and height of the tool. Object was to pre-plan the eventual position of every skid, with an eye to space conservation.

Planners began their jig sawing with the largest templates, representing skids. All templates pertaining to a single end item were grouped. Largest templates were positioned first. Around them, the smaller were fitted in. Because locator numbers were positioned to be at eye-level (and visible from the perimeter of every bay) skids could be placed close together to further conserve space. Main aisles were held to 10-foot widths, feeder aisles to four-feet.

(Continued on page 154)



MODULE DECK is prefabricated outside the warehouse and carried by fork truck to storage area. In effect, it forms a second floor in the warehouse. Units are bolted together, but not anchored to floor.



FIRST MODERN DUNNAGE METHOD CUTS COSTS, ENDS DAMAGE!

For years the use of ordinary dunnage has resulted in millions of dollars in damage. But now U. S. Rubber has developed the SHOR-KWIK method of protecting loads with super-strong, pliable bags inflated with air. Replacing wooden braces and steel straps, new U. S. SHOR-KWIK dunnage bags keep loads tight and damage-free — at tremendous savings in man-hours and materials. Placed between packed cargo at vital spots and then filled with air, U. S. SHOR-KWIK bags immediately hold the load tightly in position — and continue to hold the load tight during transit. This reduces the damage caused by impact. These dunnage bags are so easy to handle and place that they cut shoring time at least 50%. SHOR-KWIK dunnage bags are so tough and durable that they can be used over and over again for years. Learn more about the versatility and economy of U. S. SHOR-KWIK dunnage — send for this informative booklet. Write: United States Rubber, P.O. Box 1453, Providence 1, R. I.

United States Rubber

Circle No. 163 on Reader Service Card for more information

he'll never buy that brand of Beer again—

So far he's broken four fingernails, scratched himself twice, ruined his penknife, run a staple through his thumb, and he still hasn't reached the beer. I'll bet he wouldn't buy that brand again if they enclosed 15 shares of brewery stock in each carton.

That's why more and more companies are finding that it builds sales to use GLAS-SERT Gummed Tape to close cartons. GLAS-SERT provides a dust proof, economical closure that is speedily applied and easily opened by the customer. It also effects substantial saving through re-use of cartons.

FOR ADDED STRENGTH AND PROTECTION

A REDCORE product

- GLAS-SERT is reinforced in both directions with Rayon and Fibre-glass strands.
- Because 2 strips will do the job, Rexford's GLAS-SERT is especially suitable for high speed automatic taping machines and saves you two-thirds the time when your carton is sealed by hand.

So, whatever closing method you employ . . . hand sealing or automatic taping machines . . . seal all your cartons with Rexford's GLAS-SERT.

- Protective packaging with Polyethylene keeps GLAS-SERT "factory-fresh" . . . always ready to use . . . to the last roll in the box!

Rexford PAPER COMPANY
MILWAUKEE 9, WISCONSIN
Branch Offices: NEW YORK, N.Y. • CHICAGO, ILL.
COLUMBUS, OHIO • PHILADELPHIA, PA. • FT. SMITH, ARK. • ATLANTA, GA.

Circle No. 131 on Reader Service Card for more information

LINEAR PROGRAMMING . . .

(*Continued from page* 81)

that round trip, must be made will show that the total round-trip can be accomplished three times. Then, three of the A—C trips can be crossed out, and all three of the C—A trips can be crossed out as already assigned to round-trips.

A similar process of inspection and assignment to round-trips will include all the moves loaded and moves with empties. One possible listing of round trips can be shown in Fig. 6.

Here, the round-trips have been segregated into two, four, six and eight leg round trips. They have been numbered for reference in the remainder of the problem. Many possible arrangements of round trips are possible. The particular arrangement that is used makes little difference to the problem.

Now that the round-trips have been developed, it is necessary to determine the average time required for each. This is done by using the previously obtained labor standards information. The average time required to accomplish (1) can be determined from the elements composing the round trip. For example:

Trip (1) A — C —A

Elements required per round trip:

- Load at A
- Move loaded truck from A to C
- Unload at C
- Load an empty at C
- Move the empty from C to A
- Unload at A

The average total time required to accomplish this trip would be 1.17 hours.

Similar calculations would be made for each of the round trips. These calculations are summarized in Fig. 7.

In Fig. 7, the total time required to accomplish the total number of each round-trip has also been included. It can be seen that none of the round-trips, as they now

Rely on your AIM*... Wheeling Steel did...

Sheet steel packaging bottleneck eliminated

Acme Idea Man, R. F. Henkel helped Wheeling Steel build packaging output 300%.

WHEELING STEEL sought an idea for speeding up steel strapping of 7-10 thousand pound lifts of galvanized "Softite" sheet steel. Manual strapping output was low because of inconvenient methods of steel strapping lifts on floor and tables. Working with their Acme Idea Man, Wheeling Steel Corporation, Wheeling, West Va., developed a centralized conveyor line and steel strapping procedure (Idea No. U6-5).

Now, varying sizes of lifts move from prime piler to transportation without manual handling. Acme Steel hydraulic tools apply heavy duty steel strapping, tension, seal and cut.

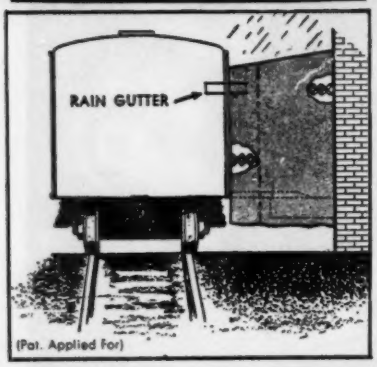
The operation is safe, fast, economical and provides stable packages for shipping and storing. Operator fatigue is minimized. Packaging output is up more than 300% per shift.

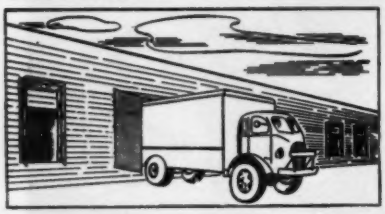
***Rely on your Acme Idea Man** for help with your packaging and shipping problems. He will discuss practical material handling techniques and their application to your operations. Call him at your nearest Acme Steel office, or write: Dept. FDU-57, Acme Steel Products Division, Acme Steel Company, Chicago 27, Illinois. In Canada, Acme Steel Co. of Canada, Ltd., 743 Warden Ave., Toronto 13, Ont.

ACME STEEL **STEEL STRAPPING**

Circle No. 2 on Reader Service Card for more information

Protect Your Loaders





• Nothing is as effective as a Dazzo retractable dock door shelter, because when extended for loading reduces drafts and heat loss in the plant while dock doors are open for loading providing comfort to production workers and personnel, custs fuel bills, effectively protects loaders from driving rain, wind, dust, sleet or snow, eliminates loaders discomfort slow-down and absentism due to weather exposure, reduce the hazard of wet and slippery docks, which are the cause of serious accidents. Protects the goods from rain, wet and soggy cartons cause complaints, claims and loss of valuable customers.

• Dazzo patented dock shelters are well engineered, they are now being used in thousands of plants effecting annual economies in hundreds of dollars and costing only a few nickels per day.

• These scissor armed retractable dock door shelters are permanently anchored on the building wall around the door. When extended the framework and fabric effectively enclose the space between the dock door and rear top and sides of truck or to top and sides of RR box car door.

DAZZO PRODUCTS
152 BLEECKER STREET
NEW YORK 12, N. Y.

Circle No. 42 on Reader Service Card

stand, could be given to a material handling truck driver for an eight hour assignment. It is necessary to evolve the truck assignment schedules, step 5 in the problem.

The truck assignments are developed by a means of inspection. Actually, all the round trips can be thought of as representing interconnected, circular paths. Since each path connects with several other paths, a truck assignment can be rather easily developed by combining and/or dividing round-trips.

Time Values Are Averages

The first thought might be to develop assignments for eight hours as nearly as possible. However, the time values used throughout the problem are averages, and probably considerable deviation will be experienced in them. In addition, it must be remembered that the less-than-once-per-day moves have not been included in the problem. Consequently, it is probably best to attempt a 5-6 hour assignment for the initial solution. This will then permit the less-than-once-per-day moves plus any unplanned material moves to be accomplished with the remaining truck time. Chances are that the 5-6 hour planned assignment will still accomplish the material handling with the same, or even less, equipment than that formerly required.

An assignment as near six hours as possible can be developed most easily by merely adding or partitioning the round trips. For example, one truck assignment might combine trip (9) and two legs of trip (1). This assignment would require an average of 6.32 hours to accomplish (3.98 hours for trip (9) and 2.34 hours for two legs of trip (1). This would be a 79 percent assignment for an eight hour day.

The remaining assignments can be developed in a similar manner and are summarized in Fig. 8.

The assignments in Fig. 8 by no means represent the only possibilities. It is evident, though, that it

Cut Costs...
INCREASE FACTORY EFFICIENCY WITH
SPEEDRY PRODUCTS

SOLVE YOUR MARKING, STENCILING, STAMPING PROBLEMS!

Speedry's patented "Capac" capillary action *guarantees* steady flow of ink. No filling! No lose ink! No mess! Speedry *Inks are instant dry, waterproof, write on any surface!*

SPEEDRY
Brushpen Kit #708

For general marking, addressing. Aluminum Brushpen. Automatic ink container keeps pen ready for use.
U.S. PAT. NO. 2416596, 254754.

SPEEDRY
Stencileer, Jr. Model #C-71

For shipping, packing, signs. Won't tear stencil letter. Yields 4,000-5,000 impressions.
U.S. PAT. PEND.

SPEEDRY Stamp-O-Mat

Super-supply of ink. Ideal for every stamping need. Releases only enough ink for job. No valves. No moving parts. Simple, automatic, reliable.
U.S. PAT. PEND.

ANY SPECIAL MARKING PROBLEMS?
Contact our Technical Service Department.
Write for Catalog

SPEEDRY PRODUCTS, INC.
Dept. F-5, Richmond Hill 18, N. Y.

Circle 151 on Reader Service Card

NOW! USS Gerrard AUTOMATIC STRAPPING MACHINE

Fully Tested, Tried and Proven

See this USS Gerrard Automatic Strapping Machine in our booth at the National Materials Handling Show, Convention Hall, Philadelphia, April 29 to May 3.

Where automation is important to your packaging and bundling problems, the USS Gerrard Model 12 Automatic Round Steel Strapping Machine is the answer to your needs. This machine has thoroughly proved its efficiency and trouble-free operation. Here, briefly, are some of its many advantages:

LOW COST—This is one of the lowest-cost automatic strapping machines on the market today.

COMPACT—Requires only 11½ sq. ft. of floor space. Table height, 31". Weight (approx.), 1500 lbs.

SPEED—Up to 24 ties per minute.

TWO SIZES—Either machine will handle packages as small as 8" wide by 2" high. The larger will handle packages as large as 26" wide by 20" high.

EASY TO OPERATE—Utilizes USS Gerrard Round Steel Strapping from 14 through 18 gauge. Easy to thread and operate.

LOW MAINTENANCE—One-shot, built-in lubrication system and compact, rugged, simple construction mean minimum service and maintenance.

TENSION—Can be predetermined, and when set is uniformly maintained on all packages regardless of size or weight.

SINGLE POWER SOURCE—All functions are mechanically controlled and interlocked. Simply plug in and run.

PACKAGES which vary in size and shape can be strapped without adjustment to machine.

COMPRESSION DEVICE for pre-compressing packages or bundles can be supplied as optional equipment.

QUIET OPERATION—Fully engineered to eliminate noise and vibration.

For more complete details, contact your USS Gerrard sales representative. Also mail coupon for folder and the Gerrard Blue Book of Packaging. This contains full information on all USS Gerrard Machines and round and flat strapping.

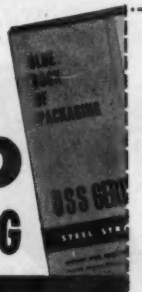
GERRARD STEEL STRAPPING DIVISION, UNITED STATES STEEL CORPORATION
GENERAL OFFICES: CHICAGO, ILLINOIS

USS

USS GERRARD STEEL STRAPPING

Round and Flat

UNITED STATES STEEL



USE THIS COUPON

Gerrard Steel Strapping Division
United States Steel Corporation
2937 W. 47th St., Chicago, Illinois

Please send me folder on the Automatic Strapping Machine and the 36-page GERRARD Blue Book of Packaging. No obligation.

Name_____

Company_____

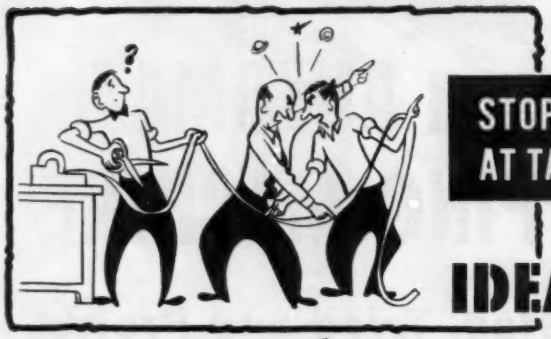
Address_____

City_____ State_____

Have Salesman Call ☐

Circle No. 61 on Reader Service Card for more information

Circle No. 75 on Reader Service Card for more information



STOP GUESSING AT TAPE LENGTHS

try the

IDEAL 200E

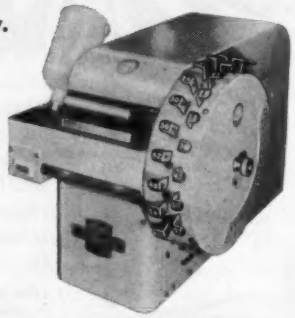
automatic *Electric* CLIP-A-TAPE

Measures and Cuts up to 105" Accurately.
No more "guess & mess".

Offers Unequalled Speed — exclusive Selecta-matic keyboard.

Allows two operators to work side by side without conflict.

Other Time and Tape-saving Features, too! Including thermostatically controlled water heating unit, easy tape reloading, adjustment for greater tape widths up to 4", non-rust materials where rust and corrosion attack ordinary tape dispensers.



IDEAL STENCIL MACHINE CO.

FREE Illustrated Brochure

104 IOWA AVE., BELLEVILLE, ILL.

LINEAR PROGRAMMING

Continued

is difficult, if not impossible, to equalize exactly all the assignments. These assignments can be presented to the drivers at the beginning of the day as a schedule for a portion of their daily operation. It is possible to prepare the schedule in such a manner that the driver is instructed as to the type or part number identification of the material to be delivered throughout the day's operation.

Considerable lattitude is possible in developing the truck assignments. Figure 9 illustrates another set of possible assignments for six trucks with an average planned utilization of 89 percent.

This type of assignment will work only where little deviation is experienced in the average time per trip, and where maximum control over the material handling operation and personnel is possible.

(Continued on page 130)

Eliminates Shipping Labels!

PRINT DIRECT

Speeds Up Freight Marking

Quick! Accurate! Easy! Print shipping information direct on cartons, boxes, packages. Eliminate double operation of preparing labels and then pasting them to the containers. Get 1,000 or more clear, sharp impressions from one stencil without re-inking. New FORM-CUT Stencil has facsimile of your label or shipping form die-impressed into the stencil. Then type or write in address or identification data . . . attach to duplicator . . . and print, like using a rubber stamp. Write for Literature and FREE SAMPLE FORM-CUT STENCIL AND PRINT.

THE ORIGINAL HAND STAMP STENCIL DUPLICATOR

IT PRINTS ANYWHERE

OVER 35 YEARS

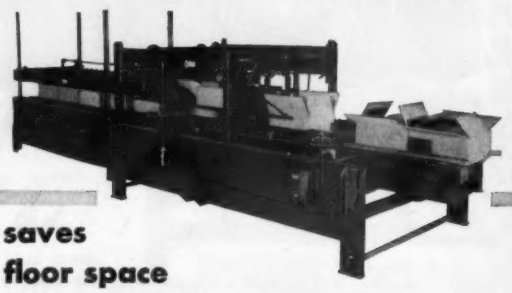
Also for addressing shipping tags and labels . . . prints, postcards, menus, forms, bulletins. 8 complete outfits: $9.50 to $99.50, including supplies (f. o. b. factory). at office or shipping room supply dealers.

MULTISTAMP STENCIL DUPLICATOR

MANUFACTURED ONLY BY THE MULTISTAMP CO. NORFOLK, VIRGINIA

Circle 109 on Reader Service Card for more information

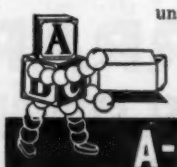
A-B-C Short Case Sealer



saves floor space

This A-B-C- Short Case Sealer really increases packaging efficiency. Glues, folds and seals either or both top and bottom flaps in one operation—automatically. Speeds up to 30 cases a minute. Finest welded construction. Ball bearing construction reduces maintenance. Guaranteed not to get out of "time."

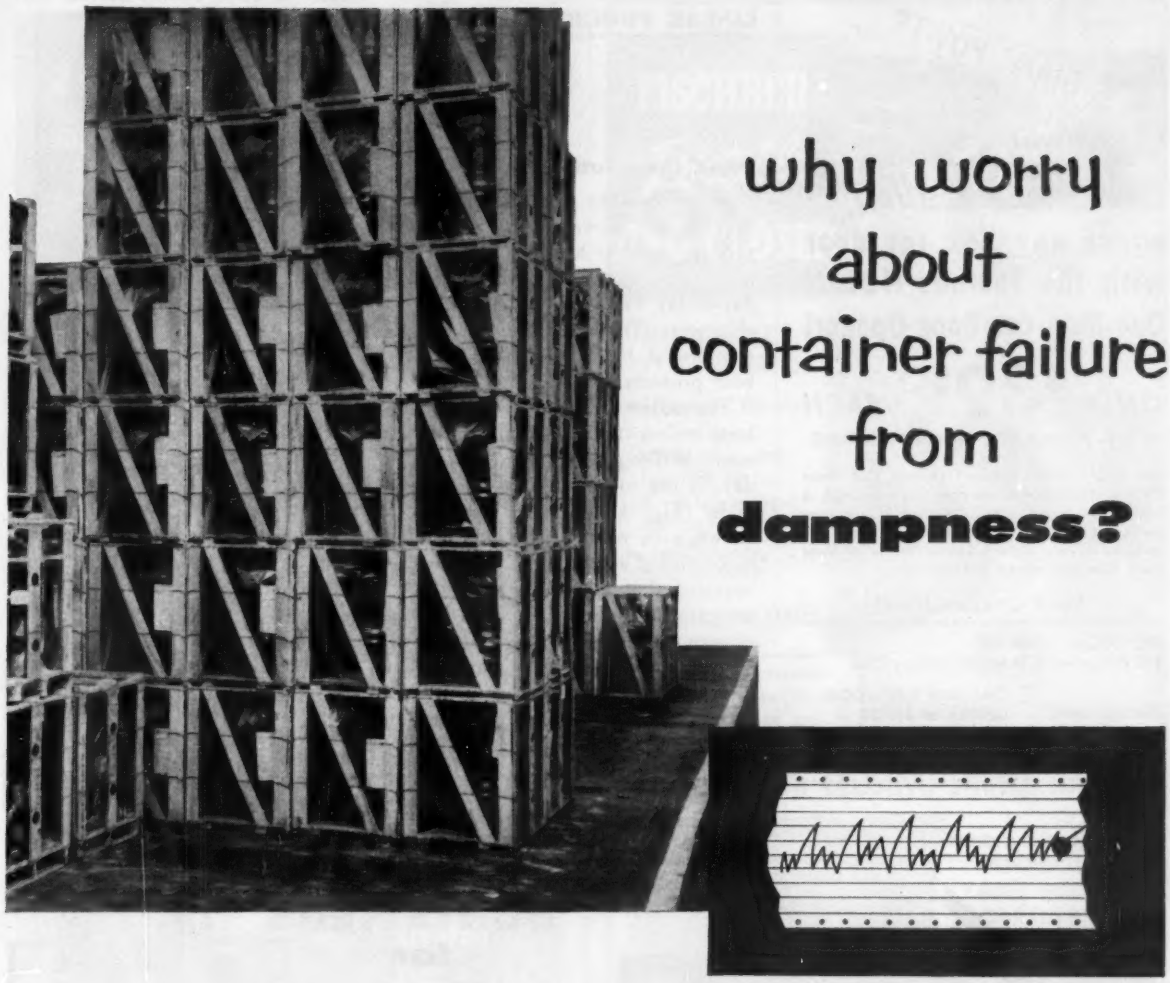
WHATEVER YOUR PACKAGING PROBLEM, there's a proved A-B-C machine to solve it—case sealers, unloaders and unscramblers, side sealers and hand gluers.



WRITE TODAY FOR DETAILS— FLOOR PLANS & SPECS

A-B-C PACKAGING MACHINE CORP. TARPON SPRINGS, FLORIDA

Circle 17 on Reader Service Card for more information



why worry about container failure from **dampness?**

protect your product with

wirebound

Dampness or direct contact with water does not harm durable Wirebound containers.

Containers made from other kinds of materials are often reduced to the point of collapse, cannot be stacked safely when stored under damp or humid conditions or exposed to unexpected wetness. This type of damage adds considerable expense and difficulty which must be figured into the total cost of packing, handling and shipping. The rugged wood and wire construction of Wirebounds, however, provide a container unaffected by moisture. Wirebound boxes and crates assure the storage savings of high stacking . . . even under dampest conditions. Use Wirebounds to eliminate all extra hidden and unexpected costs—know your total cost in advance.

Write for informative booklet, "Materials Handling, Stacking, Warehouse Applications."

Wirebound
BOXES & CRATES

WIREBOUND BOX MANUFACTURERS ASSOCIATION

Room 1171, 327 South LaSalle Street, Chicago 4, Ill.

Circle No. 113 on Reader Service Card

opens any box car door with the famous NOLAN One-Man Car Door Opener!

ONLY $39.50 EACH

F.O.B. NOLAN CO., BOWERSTON, OHIO

The 1957 model Nolan One-Man Car Door Opener easily multiplies one man's strength a hundred-fold and more! Opens the most cantankerous box car door with little effort in 20 seconds or less, without danger to life or limb! Save time and money with the Nolan!

Send Coupon Now!

THE NOLAN COMPANY
110 Pennsylvania Street, Bowerston, Ohio

Please send ☐ ONE-MAN CAR DOOR OPENER at $39.50
☐ FREE LITERATURE

NAME_____

ADDRESS_____

CITY_____ ZONE____ STATE____

LINEAR PROGRAMMING

Continued

Using the solution

This solves the problem for an average day. However, it is necessary to develop assignments, for every day, that will include the day-to-day variations in material shipments. This can be easily accomplished by a clerk who has been properly trained.

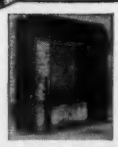
The major variable in the problem, unless the material movements differ greatly from day to day, is the solution to the return table (Fig. 4). Here, it can be shown, even with variations in the quantities of empties available and required, that the *placement* of the assignments in the table will not change even though the size of the assignments may change. This fact permits rather rapid and easy solution of the return table for any particular day's operations. The development of round-trips and trip assignments can be rather easily accomplished with some

Circle No. 31 on Reader Service Card

CAPCO DOCK COVERS GIVE YEAR 'ROUND PROTECTION

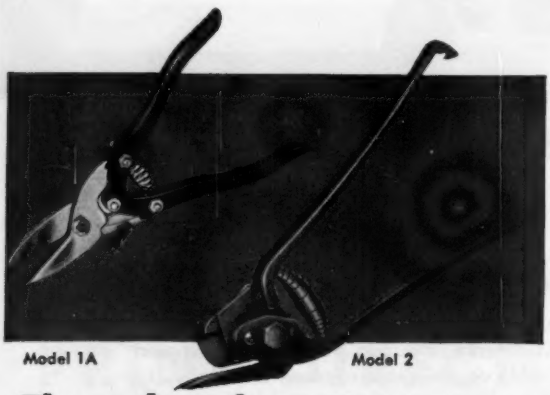
CAPCO Dock Covers completely enclose the space between car and building doorways protecting loading and unloading during bad weather ... preventing accidents ... insuring against loss of heat or refrigeration. 51 different models in any size for every loading problem.

Write for literature and name of nearest distributor.



CAPCO

522-24 PROSPECT AVENUE • KANSAS CITY 24, MISSOURI



Model 1A Model 2

These handy cutters open strapped containers fast

These Signode strap cutters save a lot of time in receiving and shipping rooms. The inexpensive Model 1A cuts all sizes of steel strapping up to and including ¾" x .023"; Model 2 cuts all sizes up to and including ¾" x .035". The extended lower lip of Model 2 slips easily under tightly tensioned strapping on boxes, crates and bundles. Other cutters for strapping up to 2" x .050. For details and prices, write:

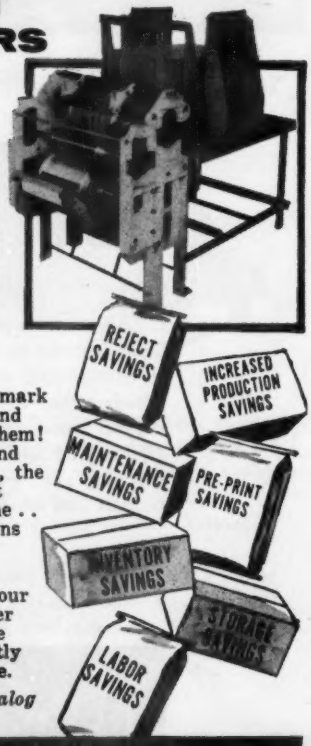
SIGNODE STEEL STRAPPING CO.

2618 N. Western Avenue, Chicago 47, Illinois
Offices coast to coast.
Foreign Subsidiaries and Distributors World-Wide
In Canada: Canadian Steel Strapping Co., Ltd., Montreal • Toronto

Circle 144 on Reader Service Card for more information

PRE-PRINT CONTAINERS for EXTRA PROFITS

.....use industrial's NEW AUTOPRINTER!



With the new, modern Autoprinter, you date, mark or code multiwall bags and containers as you need them! Completely automatic and electronically controlled, the Autoprinter works right with your production line . . at up to 3,000 impressions per hour!

Investigate how the Autoprinter can speed your operation, save container pre-printing and storage costs, and eliminate costly manual marking expense.

Write for details and catalog today. Dept. F

ime

Circle 77 on Reader Service Card for more information

Users report lower packaging costs with TAPE-STRAP®

gummed filament tape

MATTRESS 50% less

UPSET Products 60% less

METAL SHELF 7.7% less

You can package almost anything better, for less, with Tape-Strap. Write for sample roll and complete data.

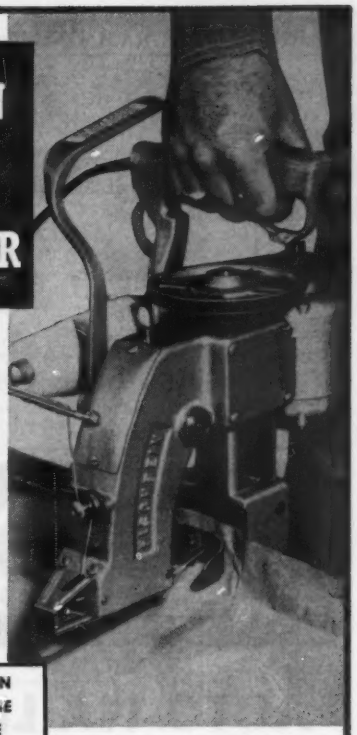
MID-STATES Gummed Paper Company

Dept. 518, 6850 S. HARLEM, BEDFORD PARK, ILL., ARGO P. O.

New York Syracuse Philadelphia Boston Atlanta
Cleveland Detroit St Louis Los Angeles

Circle 106 on Reader Service Card for more information

FISCHBEIN *Portable* BAG CLOSER



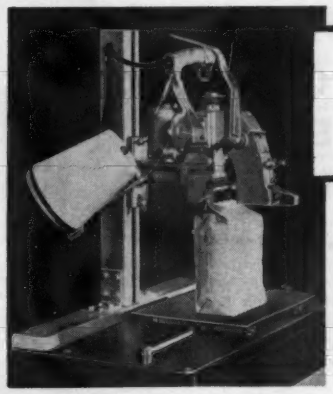
HANDLES ALL TYPES OF BAGS!

- Total weight. 10½ lbs.
- Requires no installation . . . plug into any outlet
- Simple to operate and maintain
- Lowest priced bag closer on market

FULLY GUARANTEED!

OPTIONAL SUSPENSION UNIT ADAPTS MACHINE TO STATIONARY USE

NEW! FOR CLOSING SMALL BAGS!



FISCHBEIN TABLE MODEL CARRIAGE CONVEYOR
(Model FS)

One simple knob locks any Fischbein Portable Bag Closer into proper sewing position. Carriage slides freely and returns automatically to starting position, ready for next bag.

UNIQUE VERSATILITY! Any Fischbein Bag Closer can be used 3 different ways!

1. Completely portable
2. Suspended with counterbalance
3. On carriage conveyor for closing small bags

FOR DETAILS, MAIL THIS COUPON TODAY!

DAVE FISCHBEIN CO., DEPT. 4B
2730 30th Ave. S., Minneapolis 6, Minn., U.S.A.

Name_____

Firm Name_____

Address_____

City_____ Zone____ State_____

Circle 57 on Reader Service Card for more information

practice. In other words, this approach is not impossible to accomplish on a daily basis.

Good Communications Are Important

Most industrial people will, about now, no doubt have a question in mind. It probably is: "What happens when a driver finds that a loaded container or an empty is not ready for him at a particular point in his assignment?" This problem can be licked very easily where radio dispatch is used for the material handling operations. It will also work through use of the usual in-plant telephone system. The driver merely notifies a dispatcher—who reviews the status of the operation and either instructs the driver to wait for his load or to take another driver's load and subsequent trip assignment. In the latter case what is accomplished is nothing more than a trade of assignments between drivers. When one knows the time required per assignment, it is not too difficult to have check or call-in stations in each truck assignment. This provides better control over the entire handling operation.

Variety of Containers May be Used

This particular application has many possible ramifications. In the problem presented, the same type of container was assumed for all materials. This assumption can be relaxed, and a variety of material containers—reusable skids and pallets, special racks, and single use cartons—can be included in the problem. In such cases, the return table is restricted to returning containers to where they can be used. In the case of non-reusable containers (containers such as cartons consumed or disposed of in the manufacturing operations), the return table represents minimum deadheading.

The problem implied no time requirements on material deliveries within the eight hour day. Time requirements for deliveries can be included rather easily since considerable lattitude is possible in round-trip and truck assignments. Even more lattitude is possible in similar problems where more than one equally optimum solution is possible in the return table. (Another problem solved recently had sixteen equally optimum solutions to the return table.)

Good for Small Plants, Too

The problem developed here implied, in the time values, a relatively large plant operation. This same approach works equally well regardless of the size of the time values, although the possible improvement may be limited when many moves of extremely short duration are present.

A somewhat similar approach has been made in an operation in a military establishment, where material handling is accomplished by highway tractors and trailers. In this case, the operation was one of relatively large scale, controlled by radio dispatch. A dis-

SHORT RUNS MADE AT MASS-PRODUCTION COST

AUTO-NAILERS

Speed Production of

SKIDS
SHOOKS
PANELS
CRATES
PALLETS

Makes and drives its own nails in accurate lengths up to 2¾ inches, as fast as 3 NAILS A SECOND. Auto-Nailer nails stay put . . . won't back out.

Multiple installations may be used with single or multiple remote control. *Hurricane* drive eliminates splitting. Controlled depth drive; controlled countersink.

We will gladly make a free engineering study—frank and unbiased—relating Auto-Nailers to your production problems. Write us.

PLAIN BRAD CLINCH

AUTO-NAILER

AUTO-NAILER CO., 269 Marietta St., N.W., Atlanta 13, Georgia

Circle No. 15 on Reader Service Card for more information

patcher prepares the truck assignment and controls the material handling operation via radio. The application of the mathematical programming approach realized an improvement in handling operation with a reduction in the quantity of men and equipment required.

Our particular application, in which mathematical programming is a relatively small part of the problem, does serve to illustrate the new look of linear programming in tackling industrial problems. It's a new look that can be applied to a wide variety of industrial operations. It should be noted, however, that not all applications are as simple as this one.

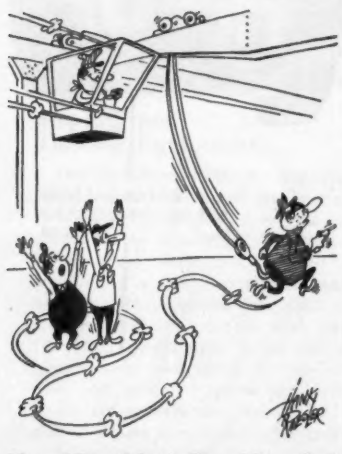
References

W. W. Cooper & A. Charnes. "*Transportation Scheduling by Linear Programming*". Proceedings of the Conference on Operations Research in Marketing. Case Institute. January '53.

R. O. Ferguson. "*Linear Programming*". American Machinist special report 389. 1955.

A. Henderson & R. Schlaifer. "*Mathematical Programming: Better Information for Better Decision Making*". Harvard Business Review. May-June '54.

T. C. Koopmans (Ed). *Activity Analysis of Production & Allocation*. John Wiley. 1951.



Play Him, Mac! Tire Him Out A Little More!

How to get your shipments out faster, at less cost

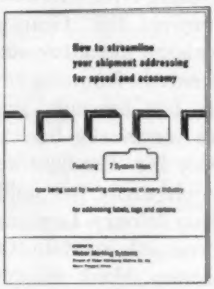
New 16-page booklet shows how easily it can be done through more systematic addressing of cartons, labels and tags

Slow, old-fashioned methods of stenciling and labeling can seriously delay your shipments. While a shipment sits on the dock ready to go, an office girl is writing out labels by hand. While a stack of cartons waits to be stenciled, a shipping clerk spends precious minutes looking through the files for the right stencilboard. And, because the pressure is on the shipping department to get orders out quickly, cartons are improperly marked and then lost enroute.

A vital operation

The stenciling and labeling of shipments is one of the most important operations in the plant because nothing gets shipped until it's been addressed. You can have the most carefully laid plans for getting your product from the production line to your customer, but if it isn't labeled, tagged or stenciled it never gets out of the plant.

Efficiency-wise companies are rapidly discovering that the key to a really efficient shipping operation is a system for addressing. This system should be fast, inexpensive, require a minimum of labor, and be tailored to your particular order-processing and material handling procedure.



Available now . . . Send for your free copy

CONTAINS USEFUL INFORMATION

- How to determine the efficiency of your present shipment addressing operation
- The key to a modern, efficient shipping department
- The latest direct-to-carton stenciling systems
- Printing and addressing your shipping labels in one operation
- How to prepare your shipping stencils with your order-invoice or bill-of-lading forms

Comprehensive booklet

In the 16-page booklet offered here you will find such a system. Thousands of companies who have already adopted them have cut their shipment addressing time by as much as 50% to 70%. Send for your free booklet. There is no obligation.

Weber Marking Systems Div. of Weber Addressing Machine Co., Inc., Mount Prospect, Illinois

Sales and service in all principal cities

Weber

WEBER MARKING SYSTEMS
Dept. 1 E
Mount Prospect, Ill.

Kindly send us a copy of "How to Streamline Your Shipment Addressing for Speed and Economy."

COMPANY_____

INDIVIDUAL_____

POSITION_____

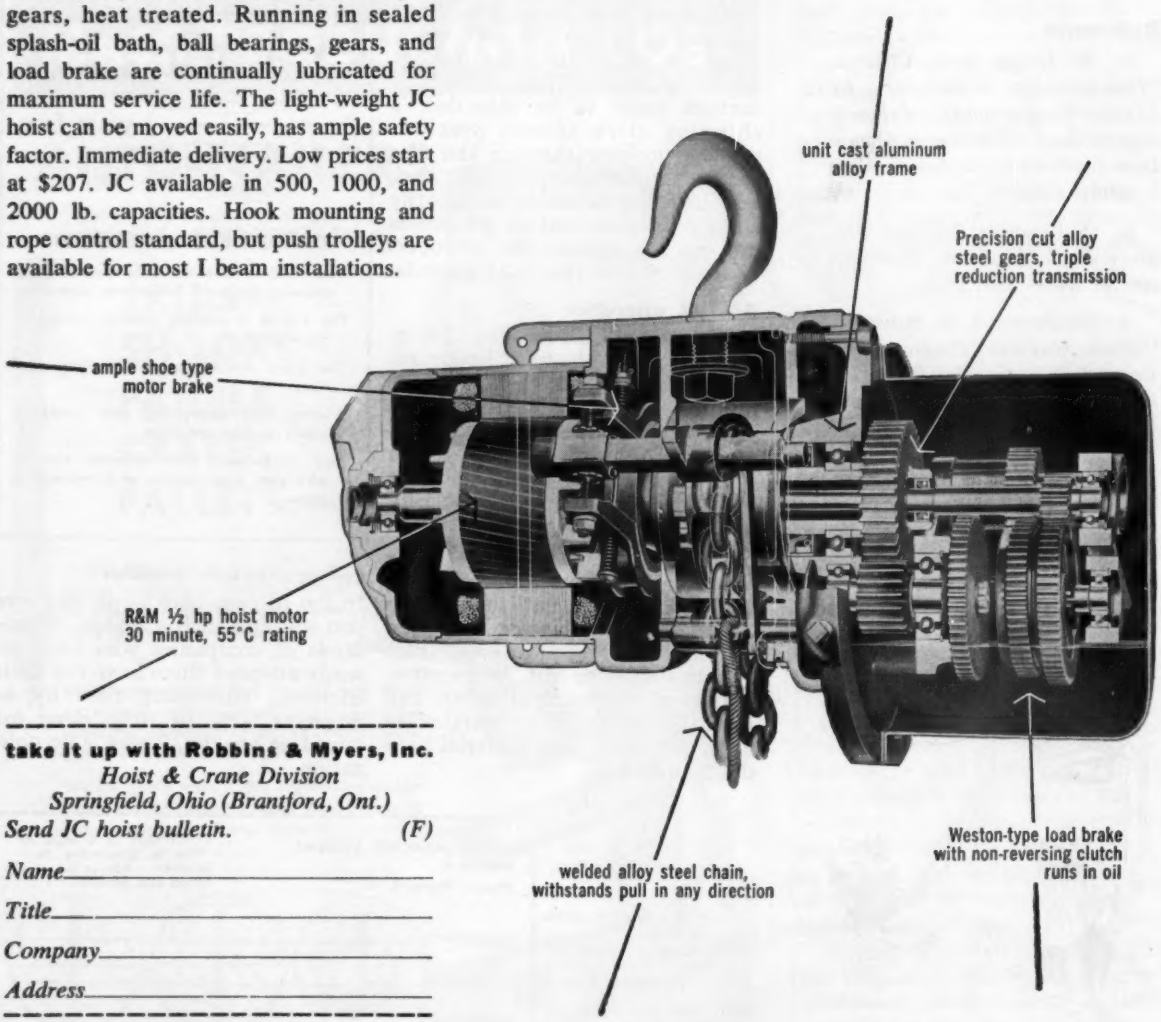
ADDRESS_____

CITY_____ ZONE____ STATE_____

Circle No. 166 on Reader Service Card for more information

R&M JC chain hoists are ahead of competition in quality—right with it in price. See for yourself why more value for the same money is yours in the JC. The ½ hp R&M heavy duty motor is equipped with an oversize shoe brake to assure quick stops, accurate load spotting, longer life. Separate load brake is Weston-type, with non-reversing clutch to prevent drift. Gearing—triple reduction precision cut alloy steel spur gears, heat treated. Running in sealed splash-oil bath, ball bearings, gears, and load brake are continually lubricated for maximum service life. The light-weight JC hoist can be moved easily, has ample safety factor. Immediate delivery. Low prices start at $207. JC available in 500, 1000, and 2000 lb. capacities. Hook mounting and rope control standard, but push trolleys are available for most I beam installations.

quality to spare


unit cast aluminum alloy frame
Precision cut alloy steel gears, triple reduction transmission
ample shoe type motor brake
R&M ½ hp hoist motor 30 minute, 55°C rating
welded alloy steel chain, withstands pull in any direction
Weston-type load brake with non-reversing clutch runs in oil

take it up with Robbins & Myers, Inc.
Hoist & Crane Division
Springfield, Ohio (Brantford, Ont.)
Send JC hoist bulletin. *(F)*

*Name*_____

*Title*_____

*Company*_____

*Address*_____

ROBBINS & MYERS **hoists • cranes • winches**

Circle No. 133 on Reader Service Card for more information

WHAT'S NEW IN USEFUL LITERATURE

A bibliography of New and Current Manufacturers' Publications available upon request. Indicate choice (s) on self-mailing Reader Service Card on pages 35 and 36.

Performance Report:

A performance report, "7 Steps to Lower Costs", describes and diagrams the seven operations two Trackmobiles perform at Verson Allsteel Press Company. The report, offered by the Whiting Corporation, states that the vehicles move a minimum of 100 freight cars a week and often carry loads up to 500,000 pounds. Between freight movements, the trucks move indoors, and do much of the inside handling.

Circle 195 on Reader Service Card

New External House Organ:

"Elpar Lift For Industry", a new quarterly external house organ, has just been published by the Elwell-Parker Electric Company. The magazine features an article on preventive maintenance for industrial trucks and includes actual work charts which may be used for such programs. The issue also contains a series of picture stories describing specific handling problems and their solutions.

Circle 196 on Reader Service Card

D-C Crane Control:

D-C control systems for precision hoists, bridges, and trolleys are featured in Bulletin GEA-6434, available from General Electric Company. It provides information on special crane controls, typical speed-load curves of D-C hoist control, product descriptions, and features components for D-C crane controls.

Circle 197 on Reader Service Card

Stapling and Tacking Equipment:

The complete line of "Duo-Fast" manual and air-operated stapling and tacking equipment is described and illustrated in a new catalog released by Fastener Corporation. A brief description of a tacker or stapler, model number, type of staples used, and special features are listed on each page. Operating photographs point out applications for each machine. Duo-Fast's new foot power staplers and bench model air staplers and tackers are included, as are specifications for guides, attachments and other accessories available for the complete line.

Circle 198 on Reader Service Card

New Ideas and Developments:

The latest issue of the "Rapistan Rapid Handler", published by The Rapids-Standard Company, Inc., is now available. It contains new ideas and the latest developments on Rapistan equipment. Unique installations are discussed and illustrated, and the latest literature on their equipment is described.

Circle 199 on Reader Service Card

Portable Cranes For Multiple Uses:

Safety, stability, versatility and efficiency are factors stressed in an illustrated bulletin describing Tubar cranes, produced by Uhrden, Inc. The data includes capacities, dimensions and specification as well as suggested uses. These cranes are equipped with roller bearing wheels so that they can be easily rolled to wherever they may be needed.

Circle 200 on Reader Service Card

Manually Propelled, Battery Operated Lift Trucks:

A new, illustrated 24-page catalog described the latest developments on its complete line of manually propelled, battery operated hydraulic lift trucks has been released by Big Joe Manufacturing Company. Various straddle type units as well as the direct-pallet-approach "Counterweighter" units, are described. Included is the manufacturer's concept of applying hydraulic handling to every department to achieve maximum handling potential. A price sheet on the line is also available.

Circle 201 on Reader Service Card

Automatic Lock For Large Shipping Containers:

A standardized locking device which may be installed on any new or existing, large shipping container is described and illustrated in a two-color brochure provided by Clark Equipment Co. Called the Mobilock Latching Mechanism, it is dimensionally controlled so that it will automatically locate and securely lock to any rolling transportation unit equipped with the Mobilplank Anchor Mechanism.

Circle 202 on Reader Service Card

Manual On Industrial Truck Batteries:

Details and engineering specifications covering the firm's new "Thirty" truck battery are provided by Gould-National Batteries, Inc., in an 8 page, 2-color bulletin. Illustrations include exploded views and parts pictures. There are tabulated data for the three available ampere-hour capacities—40, 60 and 120), dimensions for grouping of cells in wood or steel trays, and terminal connectors. Also described is the Gould industrial truck discharge indicator.

Circle 203 on Reader Service Card

Purifying LP-Gas Exhausts:

Tests on the removal of carbon monoxide and other air contaminants from exhausts of LP-Gas powered trucks are described in a reprint offered by Oxy-Catalyst, Inc. Titled, "Sweetening the Fork Truck's Breath", the reprint is of a paper read at the 44th National Safty Congress and Exposition by Berton Karol, Chief Engineer of the firm's automotive division.

Circle 204 on Reader Service Card

Pictorial Guide to Handling:

Over a hundred types of equipment to save time, money and labor in handling materials are described and illustrated in a colorful catalog just issued by Fab-Weld Corp. It includes items of values to virtually every type of business.

Circle 205 on Reader Service Card

Three-Dimension Space Planning:

How to use a cube form of visual planning—for three-dimensional layouts of processing operations—is shown in a booklet provided by "Visual" Plant Layouts Inc. The planning kit and its application are pictured and thoroughly described. A price list is included.

Circle 206 on Reader Service Card

3 and 4 Cubic Yard Tractor Shovels:

Engineering, design and construction features of two tractor shovels, HD-16G

and HD-21G, are discussed in a new bulletin issued by the Allis-Chalmers Manufacturing Company, Construction Machinery Division. Operating, performance and maintenance advantages are pointed out through pictures and story. The 8-page catalog contains specifications, and illustrations and descriptions of features of the tractor shovels.

Circle 207 on Reader Service Card

Describes Material Handling Course:

A 16-page brochure is available describing the fourth annual Material Handling Training Conference, which this year will be held June 16-29 at Lake Placid, New York. The literature describes the curriculum of the course and its faculty, and explains what type of participants are most likely to benefit from it. It also describes facilities available at Lake Placid.

(Also reviewed in April)

Circle 208 on Reader Service Card

New Catalog on Conveyors:

Design, features and applications of the in-floor Towveyor and overhead Tow-Conveyor systems are discussed in the entirely new "Webb Catalog 157". The catalog, available from the Jervis B. Webb Company, gives complete mechanical details for every component part of both types of conveyor systems. Illustrations and pictures are included showing actual installations that have been made in freight terminals, warehouses, and manufacturing plants.

Circle 209 on Reader Service Card

Tips on Longer Life for V-Belts:

A new 12-page bulletin, released by Allis-Chalmers Manufacturing Company, discusses simple precautions to prolong the life of V-belts and increase drive efficiency. It describes various types of V-belts and tells how to select and match them, and lists seven steps for correct installation. Many hints for making belts last longer, and the eight most common causes of V-belt destruction are illustrated and explained. Information in the bulletin is applicable to all types of V-belts manufactured today.

Circle 210 on Reader Service Card

Answers Storage Problems:

The new No. 303 Storage Rack catalog, recently developed by Pollard Brothers Manufacturing Company, is said to answer many storage rack problems. Illustrations and specifications show how the company's bar, vertical, sheet steel and die storage racks were designed for easy assembly and for flexibility of operation.

(Also reviewed in April)

Circle 211 on Reader Service Card

Ratchet Hoist for Multiple Uses:

The Yale & Towne Manufacturing Company has published a new catalog covering its lines of Pul-Lift ratchet hoists. These lightweight, versatile tools are available in roller chain and link chain models, and are produced in capacities from ¾ ton to 15 tons. Complete specifications for the various models are included in the literature.

(Also reviewed in March)

Circle 212 on Reader Service Card

Lease LP-Gas Cylinders:

Information is available from the L P G Leasing Corporation about a new leasing plan for 100 pound LP-Gas cylinders. The cylinders complete with valves are available on a long term lease basis. According to a company spokesman, they may be purchased any time during the life of the contract at a depreciated value.

Circle 213 on Reader Service Card

Pocket-Size Reference Book:

A new pocket-sized reference book, consisting of 28 pages, has been released by Nutting Truck and Caster Company. It illustrates trailers, dragline trucks, jacks and skids, wagon trucks, barrel handling equipment. 2-wheel and 4-wheel trucks, plus a variety of casters and special duty trucks. Included are complete specifications, as well as "in use" photographs.

(Also reviewed in April)

Circle 214 on Reader Service Card

Ten New Bulletins Available:

Magline, Inc. now offers a series of ten new product bulletins covering its complete line of 4-wheel magnesium trucks. These bulletins present detailed descriptions and specifications on Magline platform trucks, trailer trucks, box trucks, tow-line trucks and other models in the line. Made of lightweight magnesium, the floor trucks combine durability and ease of operation for fast, efficient load handling.

(Also reviewed in March)

Circle 215 on Reader Service Card

Free Samples Help Plan Efficient Storage:

Miniature plastic storage racks are offered at no charge by Jarke Manufacturing Co. Scaled 8 to 1, they are models of the firm's Mini-Module prefabricated racks. They nest into each other, as do the full-size equipment. Models can be set up on a desk top to determine the most efficient storage arrangement for such items as bar, rod and pipe stock.

Circle 216 on Reader Service Card

Lifter Is Easily Portable:

The Colson Corporation's "Half-Tonner", a portable lift truck with a 1000 pound capacity, is described in a new bulletin available from the company. The truck is equipped with 8-inch swivel casters and 5-inch wheels for easy maneuverability, and is available with either battery or electric hydraulic power units. It is suited for operations involving piling, lifting, elevating, racking and feeding.

(Also reviewed in March)

Circle 217 on Reader Service Card

How to Buy an Industrial Battery:

To help industrial battery buyers select the most economical and efficient battery for their operation, Gould-National Batteries, Inc. has just released a new 16-page booklet entitled "So You're Going to Buy an Industrial Battery". It illustrates and describes the importance of selecting the proper battery for the job, the purpose of correct charging and handling, reasons for systematic maintenance and the value of a continuing knowledge of battery condition. Three brief case history's demonstrate the value of correct application engineering in handling battery problems.

Circle 218 on Reader Service Card

Continuous Flow with Woven Belts:

The Cambridge Wire Cloth Company describes an operation using moving belts for continuous nitriding, normalizing, cooling and waxing, in a recent issue of its house organ "The Cambridge Wire". A large spring manufacturer replaced box oven methods with woven wire belts, increasing production and reducing space requirements. Complete details are given in the literature.

(Also reviewed in March)

Circle 219 on Reader Service Card

Films On Handling:

A catalog of movies available from members of the Material Handling Institute, Inc., has been published by the MHI. It is a bound booklet indexed by subject matter and listing some 63 topics.

Circle 220 on Reader Service Card

Plywood Container is Collapsible:

Atlas Plywood Corporation's new Ply-Bound Crate is described in a new bulletin issued by the company. Ply-Bound is a maximum strength crate made of sturdy hardwood plywood. It consists of three pieces: base, top, and the tube which comprises the four sides. These sides are securely cleated at each

end, and the cleats are held together at the seams by sturdy bands of wire, enabling the entire tube section to be shipped flat.

(*Also reviewed in March*)

Circle 221 on Reader Service Card

The Growth of a Company:

"Emhart . . . its people and products", a 12-page booklet published by Emhart Manufacturing Company, tells the story of its growth and continually diversifying product lines. The brochure describes how an organization of 2,000 turns out a multiplicity of products including machinery for making glass containers, packaging machinery, automatic presses, noise suppression devices, sea water distillation systems and hydraulically-operated booms.

Circle 222 on Reader Service Card

Staples Anything from Tags to Boxcars:

Duo-Fast tackers and staplers for shipping and packaging operations are described in an illustrated folder available from the Fastener Corporation. A staple gun, tack hammer, outward clinch stapler, air pliers and portable footpower stapler are described and shown in actual use in the 6-page piece.

(*Also reviewed in March*)

Circle 223 on Reader Service Card

New House Organ Available:

The first edition of "Alden Systems Illustrated News," published by the Alden Systems Company, is now available. The booklet is devoted to information and application stories on automation, cost cutting methods and the latest developments in work simplification techniques.

Circle 224 on Reader Service Card

4-Way Valve Is Oil Pressure Operated:

Catalog 204 recently published by Rivett, Incorporated gives full details on the company's new, hydraulic 4-way valve, which is oil pressure operated by a pilot valve. This oil pressure feature permits automatic operation of the valve when the oil pilot valve is controlled mechanically. Designed for 1500 psi pressure, the units are available in seven sizes, from ¼ inch to 1½ inch.

(*Also reviewed in April*)

Circle 225 on Reader Service Card

TV System Features Remote Control:

A new 8-page descriptive brochure has just been issued by Philco Corporation, covering its newly designed line of industrial television equipment. Included in the new line are cameras with full remote control for adjustment of focus and iris apertures, and for both high and low speed tilt and pan. The booklet contains illustrations of the latest developments in cameras, monitors, controls, lenses and accessories. Also listed are several waterproof and explosion resistant housings.

(*Also reviewed in March*)

Circle 226 on Reader Service Card

Major Components of Electric Trucks:

Operational characteristics and mechanical details of its complete line of electric industrial trucks are discussed in a new brochure available from the Industrial Truck Division of Clark Equipment Company. Control circuit, power train, hydraulic system and upright assembly are described through photographs, sketches and color cutaway drawings. Advantages of automatically controlled first point of power are analyzed, and the dual field drive motor is defined in terms of user benefits. The use of a double reduction gear train, and features such as the pivoted steer axle and three independent braking systems are explained.

Circle 227 on Reader Service Card

Belting Catalog Available:

Beltings for use on conveyors, elevators and transmissions are listed in a new industrial catalog published by Boston Woven Hose and Rubber Company. The comprehensive reference book gives complete descriptions and specifications on belting for virtually all types of applications.

(*Also reviewed in April*)

Circle 228 on Reader Service Card

Stressed Packaging Economy:

Packaging cost reduction—from package design to final product shipment—is the subject of a revised Little Packaging Library booklet just published by Hinde & Dauch. Titled "How to Ship More Economically in Corrugated Boxes", the 24-page publication includes pertinent advice on the designing, testing and storing of product packages. It also includes tips on the planning of the shipping department.

(*Also reviewed in April*)

Circle 229 on Reader Service Card

Roller Skid for Moving Loads:

Loads from 1000 to 6000 pounds can be pushed or pulled in any direction with "Multiton Junior Roller Skids" described in a new bulletin released by Stokvis-Edera & Company, Inc. These units are light in weight, easy to turn, and only 3 inches high, according to the bulletin. Typical applications are described and illustrated. Other units are available for heavier loads.

Circle 230 on Reader Service Card

More Work from Tractors:

An 8-page catalog offered by Hyster Company explains how the right job attachment increases production and profit on virtually all types of tractor operations. Shown are the complete line of tractor-mounted accessories for Caterpillar-built tractors, including heavy-duty towing winches, worm drive winches, Hyspeed winches, oil well servicing winches, Hyster Donkey hoists and Hyster Yarders. Also described is the company's exclusive tractor-mounted Hystaway excavator-crane which can be equipped as a dragline, clamshell, crane, pile driver, shovel or backhoe.

(*Also reviewed in March*)

Circle 231 on Reader Service Card

Conveying Bulk Pneumatically:

Handling dry, free-flowing materials by pneumatic conveyor is the subject of an 8-page brochure (PN-500) issued by U. S. Hoffman Machinery Corp. It covers reasons for installing the firm's system, basic types available, successful application, and details on installation and possible uses.

Circle 232 on Reader Service Card

Complete Truck Line:

A new 52-page catalog, offered by the Mercury Manufacturing Company, covers the application as well as detailed specifications on the complete line of Mercury tractors, trailers, fork trucks, platform trucks and attachments. Gas, gas-electric, and electric fork trucks and gas tractors are described and illustrated.

Circle 233 on Reader Service Card

Powered Barrow Many Variations:

A new Prime-Mover that is designed specifically for construction work is

described in literature available from The Prime-Mover Co. Model L-10 unit can be used as powerized self-dumping wheelbarrow with a capacity of 10 cubic feet, a fork lift with a 6½ foot lift and a capacity of 1000 pounds, a flatbed truck with 1500 pound capacity, or many other uses described in the literature. Only 15 minutes is required to convert the machine from one use to another.

(Also reviewed in April)

Circle 234 on Reader Service Card

Conveyors Assembled at Job Site:

A new 20-page booklet describing the "Ready-Span" conveying system has been released by Joy Manufacturing Company. The conveyor consists of standardized sections of various length, bolted together in any arrangement to make the total length required. The booklet contains complete specifications and illustrations of sections and available accessories. Twelve points on "How to Select a Conveyor" are also included.

Circle 235 on Reader Service Card

Build-Your-Own Truck Kit:

A bulletin issued by Milwaukee Truck Company describes the firm's new platform truck kit. The kit comes complete with everything needed to assemble a sturdy platform truck, except the platform itself. In that way, each user can construct a truck of the exact size and shape to suit his own needs. It includes two 4-inch swivel casters and two 4-inch rigid casters, two steel handle brackets, a tubular steel handle, and sufficient nuts and bolts for assembling.

(Also reviewed in March)

Circle 236 on Reader Service Card

Closed-circuit Television:

General Precision Laboratory Inc. has just published a new four page bulletin describing their closed-circuit television. The equipment has been engineered and built for any task requiring instantaneous visual communication. It is said to deliver bright, clear, stable pictures, and operate under extremely low light levels. Individual specification sheets are available on the basic camera, remote control (outdoor and indoor) camera, camera control unit, switching unit, monitors, and projection set.

Circle 237 on Reader Service Card

The Development of an Idea:

The Exide Industrial Division of The Electric Storage Battery Company has just published a 32-page brochure, designed to acquaint industry with Exide's facilities for research and development in the battery field. The brochure explains how engineering ideas are transformed into realities through careful control in research, production and testing. A separate section describes the Exide-Ironclad Battery, and the advantages of the Silvium grid.

(Also reviewed in March)

Circle 238 on Reader Service Card

Hose Ends and Assemblies:

A 40-page Hose, Hose Ends and Assemblies Catalog is available from The Weatherhead Company. Complete and detailed information on bulk industrial hose, permanently attached hose assemblies, swaged hose assemblies and ends, hose end swivel adapters, assembly instructions and installation data is incorporated. Charts are featured in the catalog for hose agent selection, hose specifications and hose end identification. Resistance ratings of Butyl, Buna-N, Neoprene, Teflon and other synthetic compounds are identified with specific hoses.

Circle 239 on Reader Service Card

Portable Unit Closes Bags of All Types:

The Fischbein Portable Bag Closer is described in a 4-page bulletin available from Dave Fischbein Company. Weighing only 10½ pounds, the unit plugs into any electrical outlet, and requires no installation or supports. It will handle any type of textile or paper bag, including asphalt treated or specially processed bags. The average 100-pound bag can be closed in less than six seconds, according to the manufacturer.

(Also reviewed in March)

Circle 240 on Reader Service Card

Manual, Electric, and Automatic Feed:

A complete line of label pasters from 4 to 18 inches wide, are described in a bulletin available from Better Packages, Inc. There are 14 models consisting of three types; manual, electric and automatic feed. "Counterboy Label Pasters" handle labels from ½ to 18 inches wide. A coating control regulates the amount of glue applied. Illustrations and specifications of each model are included.

Circle 241 on Reader Service Card

Cut Freight Car Moving Costs:

A new, illustrated bulletin entitled, "How to Speed Up Freight Car Movement and Reduce Costs" has been issued by the Whiting Corporation. It concerns the development and use of the Whiting Trackmobile, a versatile freight car mover that travels on track or ground. It tells how this tool has saved many companies time and money by providing flexible car moving facilities. In addition, special features and other uses of the Trackmobile are discussed.

(Also reviewed in April)

Circle 242 on Reader Service Card

Easy Rolling On Rubber Tires:

Advantages of easier-rolling, demountable, rubber-tired wheels are stressed in Bulletin "D" published by Nutting Truck and Caster Co. In two colors, the booklet includes a picture sequence showing a tire replacement (requiring no special tools), specification tables, and product illustrations. Data covers wheels for floor trucks, trailers and casters—in all dimensions for regular, medium, heavy, and extra-heavy duty types.

Circle 243 on Reader Service Card

Engineering Data On V-Belt Drives:

A 112-page reference guide for the selection and design of Poly-V Belt Drives has been made available by Manhattan Rubber Div., Raybestos-Manhattan, Inc. It is an extensively illustrated book including useful charts, tables, diagrams, complete specifications for all drive sizes, and pictured descriptions of typical applications. Also provided is comprehensive information covering drive tables, horsepower ratings, installation instructions, and trouble shooting.

Circle 244 on Reader Service Card

Emphasizes Operator's Skill:

"No matter how good a machine may be mechanically, it is no better than the operator's ability to handle it." This reasoning is taken from the new Operator's Guide just released by Caterpillar Tractor Company. The illustrated, 4-color booklet describes in simple terms the way to get the most work out of a Traxcavator with the least amount of effort. The guide also illustrates the attachments which increase

the Traxcavator's versatility. Included are instructions for towing scrapers, ripping, and for using straight and angling bulldozers, log and lumber forks, quarry buckets, skeleton rock buckets, light material buckets and root and rock rakes.

(*Also reviewed in March*)

Circle 245 on Reader Service Card

Cuts Manual Handling:

The Towveyor system of in-floor dragline conveyors is described in a new bulletin available from Jervis B. Webb Company. Webb Towveyors are said to be simple in operation and require practically no maintenance. Four-wheel tow trucks carry materials without jostling or surging motion. Tow-trucks are easily engaged or disengaged from the in-floor chain track. The literature describes several applications where the system is said to have cut handling cost considerably by reducing manual handling.

(*Also reviewed in April*)

Circle 246 on Reader Service Card

Automatic Lubrication in Packaging:

Six important reasons for the use of automatic lubrication equipment in various packaging and food processing industries are given in a six-page reprint offered by Bijur Lubricating Corp. Titled, "How Automatic Lubrication Cuts Packaging Costs", it discusses seven different installations, describing operating problems and maintenance solutions. Also described is a typical system installed on packaging machinery.

Circle 247 on Reader Service Card

Loads, Unloads Pallets Automatically:

A new 8-page bulletin published by Food Machinery and Chemical Corporation describes the action of the company's automatic Pallet Loader-Unloader combinations. These units are now available for stacking or unloading cartons, bottles and barrels. The FMC Pallet Loader-Unloader, designated as model 408000, consists essentially of a case unstacker and a case stacker, which have been integrated with the proper control mechanisms into a completely automatic unit. It can handle wood cases, barrels, returnable containers, etc. at rates up to 20 per minute.

(*Also reviewed in March*)

Circle 248 on Reader Service Card

One Man and Hammer Assemble Steel Container:

Sequence pictures in a brochure produced by Ackermann Manufacturing Co. show how easily and quickly the firm's "Bandbox" shipping container is assembled. With components secured by clip fasteners, the steel unit can be set up in a few minutes. It is self-palletizing, nestable, and collapsible. Standard units are 40½x40½ in. and in heights of 15 in. (14 cu. ft.); 24 in. (23 cu. ft.) and 36 in. (34 cu. ft.) Container parts are bonderized and gray enameled. Bases may be used alone as pallets. Steel covers and stacking corners are interchangeable.

Circle 249 on Reader Service Card

Scrapers Shown in Action:

The four pull-type scrapers in the Allis-Chalmers Construction Machinery line are featured in bulletin MS-1149 recently issued by Allis-Chalmers Manufacturing Company. Each scraper model is shown in action. Several of the design features are illustrated and explained in detail.

(*Also reviewed in March*)

Circle 250 on Reader Service Card

Plastic-Bound Reference To Handling Equipment:

Los Angeles area readers can obtain a 226 page, illustrated catalog—including extensive descriptions of material handling equipment of virtually every type—from Irving G. King & Co. This reference work comprises product and application data as well as tabulations of specifications and other design data. The book has a heavy flexible cover and is bound with plastic rings.

Circle 251 on Reader Service Card

Lists Features of 4000 Pound Truck:

Operating and maintenance features, specifications and dimensions of its new Clarklift-40 fork truck of 4000 pounds capacity are contained in a new full-color, 6-page booklet offered by the Industrial Truck Division, Clark Equipment Company. Drawings illustrate such innovations as swing back hood, adjustable upright assembly, quick removable counterweight and other features. Charts and graphs detail operating specifications such as lift speeds, drawbar pull, capacities at various load centers and overall measurements.

(*Also reviewed in April*)

Circle 252 on Reader Service Card

Reference on Non-Slip Container Treatment:

A data file of applications of Non-Slip Container Coating No. 1715 for shippers of packaged goods in the food, brewing, oil, glassware, and other industries concerned with corrugated containers is offered by Paisley Products, Inc. The sprayable coating permits smooth-top containers to be stacked securely for in-plant or over-the-road shipment. The file includes an inventory of equipment suitable for the automatic application of the invisible coating to containers or container blanks with existing production, packaging or conveyor lines.

Circle 253 on Reader Service Card

Magnet Controllers:

A new bulletin on its line of heavy-duty magnet controllers is announced by The Ohio Electric Mfg. Co. Bulletin MC-143 describes both the RD-1 and RD-2 magnet controllers for operating 45 to 80 inch lifting magnets. It gives typical applications for the units, schematic wiring diagrams, and overall dimensions of push-button and lever type masters.

(*Also reviewed in April*)

Circle 254 on Reader Service Card

Standard Chains and New Developments:

Conveyor, elevator and power transmission chains including mill chains, elevator buckets, and several new chain developments are described in a new catalog issued by the Moline Malleable Iron Company. Methods of installing chain and how to identify chain attachments are described and illustrated.

Circle 255 on Reader Service Card

Tips on Parcel Post:

"How to Get the Most out of Parcel Post" is the title of a pamphlet offered by Pitney-Bowes, Inc. This 8-page booklet presents helpful hints on the proper methods to employ in order to expedite your package mailings. It covers such topics as postal sizes, proper methods of addressing, how packages should be wrapped, and sealing techniques. Explanations are given for Special Handling, Special Delivery, Air Parcel Post and combining letters with 4th class mail. A special section is devoted to the advantages gained through metered mail.

(*Also reviewed in March*)

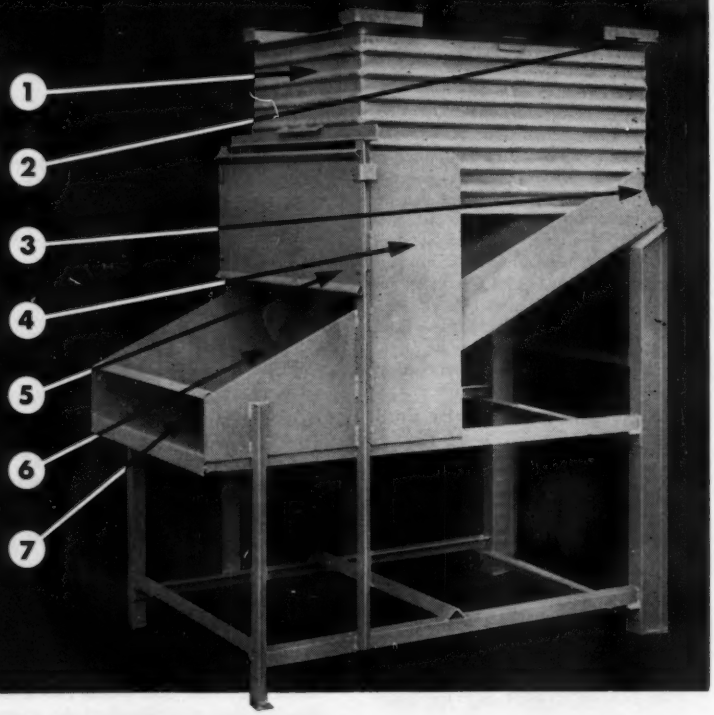
Circle 256 on Reader Service Card

Three New Trucks Described in Bulletins:

Three new 2-page bulletins describe and give full specifications on three new Yak and Yank fork trucks introduced by Mercury Manufacturing Company. These battery-operated trucks are in-

Work-O-Matic* Box and Stand for

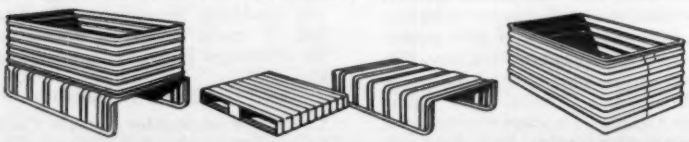
UNIT LOAD HANDLING AND WORK-LEVEL POSITIONING



Check these 7 Work-O-Matic features

1. **WORK-O-MATIC DROP BOTTOM BOX.** Heavy gauge corrugated steel construction. Square corners.
2. **CORNER STACKING ANGLES.** Safe tiering without shifting. Saves floor space.
3. **HINGED CHUTE BOTTOM.** As forks of truck are lowered, hinged bottom opens and parts slide into tray.
4. **WORK POSITIONING STAND.** Receives box from back or sides. Safely and easily transported by lift truck.
5. **CONTROL GATE.** Vertical adjustment controls flow of parts into tray.
6. **WORK-LEVEL TRAY.** Reservoir feature eliminates work stoppage when changing boxes.
7. **INCLINED TRAY END.** Assures parts accessibility. Speeds job changes.

In addition, Union Metal offers industry's broadest line of conventional type material handling containers. Write for complete catalog information. Address The Union Metal Manufacturing Company, Canton 5, Ohio.



*Patent No. 2,445,038

UNION METAL

Material Handling Equipment

Circle No. 159 on Reader Service Card for more information

USEFUL LITERATURE

Continued

tended for heavy duty material handling application such as in steel mills, metal fabricating and paper mills. Bulletin 530 describes Model 530 Yak truck with 5000 pound load capacity. The Model 730 Yank truck, with 7000 pound load capacity is covered in Bulletin 730, and Model 830 Yank truck with 8000 pound load capacity is the subject of Bulletin 830.

(*Also reviewed in April*)

Circle 257 on Reader Service Card

Guide to Overhead Doors:

The Barcol OVERdoors line of residential, commercial and industrial overhead doors is discussed in a new 16-page catalog presented by Barber-Colman Company. The book gives full information on new Weather-King flush sections, combining high-insulation-valve sandwich construction with guaranteed weatherproof facing. Weather-King panel doors, electric operators, radio controls, special controls and Wardrobe Doors are fully described and extensively illustrated.

(*Also reviewed in April*)

Circle 258 on Reader Service Card

Self-Aligning Steel Belt Conveyor:

A new steel belt conveyor, that may run close to side skirts, operate on inclines, or even be tipped sideways, is explained in a bulletin released by the Sandvik Steel, Inc. V-ropes, which are bonded to the underside of steel conveyor belts and travel over grooved sheaves to maintain proper belt alignment are described and illustrated. Additional illustrations show "Tru-Track" conveyors in use.

Circle 259 on Reader Service Card

Wire Baskets Fit All Needs:

Specialized wire containers for processing operations such as plating, heat treating, degreasing, etc. are described in a new 12-page booklet published by Wiretex Manufacturing Co., Inc. These containers are available in metals and alloys for your every need, as determined by the processing cycle. There are no limits in form, size, strength or weight. Each product is custom built. Fine or course mesh, perforated or expanded metals are available.

(*Also reviewed in March*)

Circle 260 on Reader Service Card

Aids in Idler Selection:

An entirely new method of selecting belt conveyor idlers for bulk material handling systems is introduced in Bulletin 56-80 recently published by Chain Belt Company. The entire line of Rex-Rated belt conveyor idlers is covered. The bulletin idler selection charts and

HERE'S OPEN-ROAD PERFORMANCE

. . . plant-yard size

The Allis-Chalmers Model D is a full-fledged motor grader. It is used extensively on road construction and maintenance jobs where only the finest grading performance is acceptable.

It has the basic design and performance features found in machines costing up to three times as much, but there is one important difference: The Model D is compact and maneuverable enough to maintain plant roads and yard areas where other graders cannot operate.

To add still further to its usefulness around industrial plants, the Model D may be equipped with a rear-mounted, ⅝-cu yd loader for stockpiling, loading and snow removal jobs. Optional cab offers year-round operator comfort.

Let your Allis-Chalmers dealer show you how the Model D can give you open-road grading ability in the confined areas of your plant yard. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS. *Engineering in Action*

Circle No. 3 on Reader Service Card for more information

USEFUL LITERATURE

Continued

examples which enable the reader to quickly select the proper belt conveyor idler for his specific service requirements.

(*Also reviewed in April*)

Circle 261 on Reader Service Card

Portable Lift Case Histories:

The Oster Manufacturing Company has made available a series of case histories describing actual uses of its portable lift. These application stories include examples in the plastics, aviation, motors and tubular products industries. They show the portable lift in action for warehousing, machine set-up, work in process, and intra-departmental handling applications.

(*Also reviewed in March*)

Circle 262 on Reader Service Card

Booklet on Box Closure Methods:

"A Guide To Better Closures", specially prepared for users of fiberboard boxes and packages, has just been published by Acme Steel Company. It is intended as a guide for the evaluation of methods currently in use to effect economies and stepped-up production in the closure of fibreboard boxes. A collection of information on closure methods, the facts of which have been taken from user surveys, published works and manufacturers' statements are included. A special section on regulations for sealing fibreboard containers contains the basic rules for the sealing of Regular Slotted Containers quoted from Uniform Freight Classification Number 3, Rule 41, Section 7.

Circle 263 on Reader Service Card

Reinforced Packaging Paper:

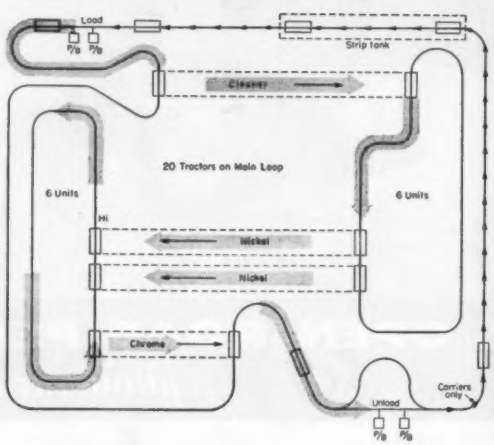
"Packaging and Protective Covering for Shipment and Storage with Reinforced, Waterproof Paper" is the title of a bulletin released by American Sisalkraft Corporation. It describes and gives complete specifications of different grades of paper. The paper can be used for such operations as case-lining, wrapping bales, rolls, and bundles, to shroud crated goods, open-car shipments, as temporary tarpaulins, for converting into bags and envelopes and lining walls of freight cars, and sheds.

Circle 264 on Reader Service Card

Slings for Varied Uses:

Literature available from The Wickwire Spencer Steel Division of The Colorado Fuel and Iron Corporation describes specific applications for the company's Uniflex, Multiflex and Maxiflex wire rope slings. Uniflex slings are

AMERICAN MONORAIL teams with Udylite plates auto bumpers at Rheem Automotive plant



Combined engineering skills resulted in substantially reduced handling costs for the plating of auto bumpers at the new Rheem Automotive plant at Fullerton, California.

32 American MonoRail automatic dispatch units move special Udylite bumper carriers on three monorail systems with 14 drop sections to maintain continuous automatic plating.

Let American MonoRail engineers solve your handling problems.

Write for Bulletin C-1

Member of Materials Handling Institute and Monorail Manufacturers Association

For Power Driven Conveyors, Use Landahl Chainless Conveyors

AMERICAN MONORAIL COMPANY

OVERHEAD HANDLING EQUIPMENT

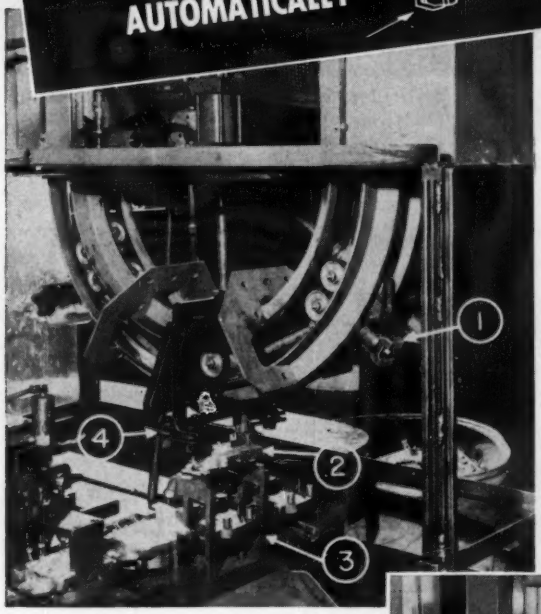
13129 ATHENS AVENUE • CLEVELAND 7, OHIO

(IN CANADA—CANADIAN MONORAIL CO., LTD., GALT, ONT.)

Circle No. 8 on Reader Service Card for more information

LANDAHL CONVEYOR

PICKS UP, KICKS OFF PARTS AUTOMATICALLY



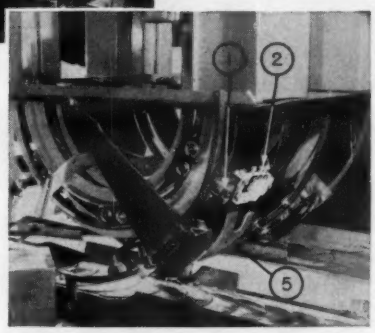
(1)
A pair of magnets are attached to the Landahl trolley.

(2)
Parts on platform conveyor move off machine.

(3)
Air lift raises part to magnet pick-up.

(4)
Landahl conveyor movement synchronized by control fingers at magnet pick-up.

(5)
Parts are stripped off magnet for transfer on platform conveyor.

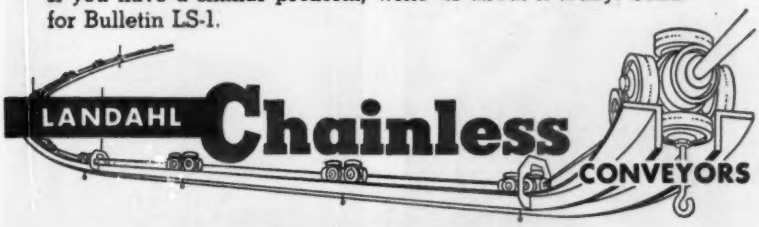


With no manpower involved, Landahl Chainless Conveyors pick up voltage regulator parts, carry them to another station, for discharge to platform conveyor.

At the pick-up station permanent magnets attached to the Landahl trolley grab and carry the parts which are lifted by an air-actuated cylinder from a platform conveyor. All movement synchronized for automatic operation.

This is typical of many ways Landahl Chainless Conveyors are being used to speed production and cut costs.

If you have a similar problem, write us about it today. Send for Bulletin LS-1.



The LANDAHL CONVEYOR CO., 13129 Athens Ave., Cleveland 7, Ohio

A SUBSIDIARY OF THE AMERICAN MONORAIL COMPANY

Circle No. 88 on Reader Service Card for more information

specially designed for uses where abrasion is an important factor; the body of each leg of the Uniflex is a single piece of rope. Multiflex slings, made from six part flat braids, are designed for maximum load-bearing surface area and ultimate flexibility in one direction. Maxiflex slings provide flexibility in all directions. Each leg is made of eight identical wire ropes braded together to form a round braid.

(*Also reviewed in April*)

Circle 265 on Reader Service Card

Fills Bags up to 200 Pounds:

An automatic open mouth bag filling machine that accommodates weights from 25 to 100 pounds is described in a brochure offered by Kraft Bag Corporation. Constructed of heavy gauge steel, the unit has a removable and adjustable filling spout, removable endless feeder conveyor belt, enclosed solenoids and hinged bagging cone. It preweighs materials to within 4 ounces, at speeds up to 24 charges a minute. Compact design allows it to be used in as little as 9'8" of head space and 12 square feet of floor space.

Circle 266 on Reader Service Card

Films Show Truck Operation:

Two 16mm films are now offered by The Raymond Corporation, showing actual operation of the firm's narrow aisle electric trucks. A film entitled "Raymond Reach Fork" describes the "truck with the boarding house reach", a scissors-type reach fork mechanism. The second film entitled "More Space in Your Warehouse" describes an actual on-the-job installation of Raymond narrow aisle high stacking straddle trucks. The story sequence covers handling and storage in a warehouse, from receipt of goods to order selection. Both films are available to interested groups on a loan basis.

(*Also reviewed in April*)

Circle 267 on Reader Service Card

Film Shows Cranes in Action:

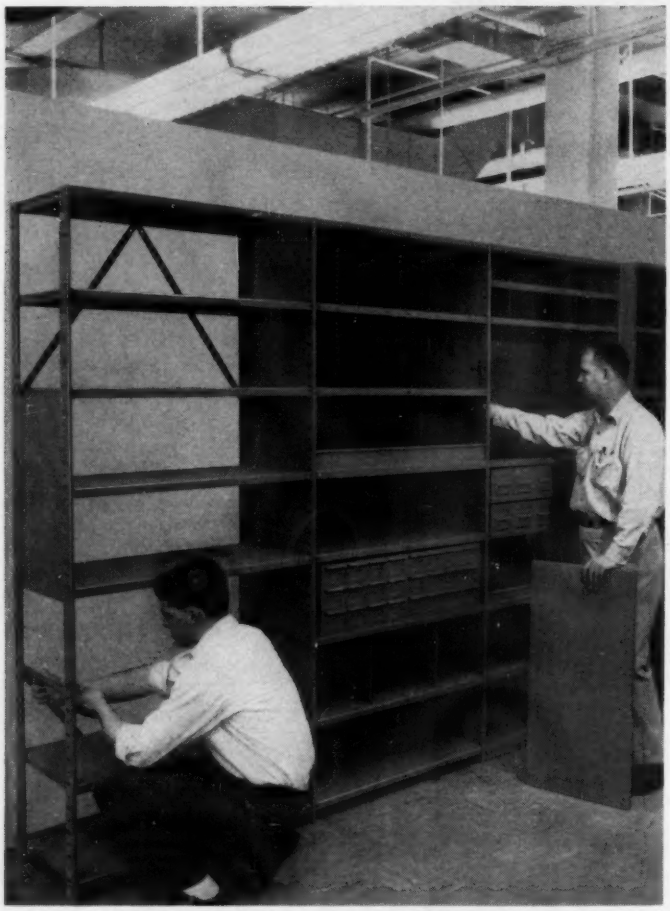
Cranes, shovels and other outdoor handling equipment are shown in action in a 28-minute 16mm film issued by Baldwin-Lima-Hamilton Corporation, Construction Equipment Division. The film deals with the subject of transportation, pointing out the important role played by such equipment in the construction of the St. Lawrence Seaway, as well as construction of turnpikes, etc.

Circle 268 on Reader Service Card

Dock Ramps for Air or Electric Operation:

Globe Hoist Company's new line of Trans-O-Matic Ramps is described in a 6-page illustrated bulletin just published. These power-operated, automatic leveling dock ramps are manufactured

Only New HALLOWELL *ERECTOMATIC.* Steel Shelving



LESS TIME, MORE UNITS PER HOUR, lower costs with Hallowell ERECTOMATIC steel shelving. Maximum adaptability to meet changing conditions, too.

No matter what type of shelving you need—open, closed, bin units, ledge units, counter or cabinets —there's new Hallowell ERECTOMATIC® steel shelving to make your job easy. The unique built-in locking device* speeds assembly and rearrangement of shelving. To position a shelf—just slide it into place on the shelf supports, press the locks, and the shelf is locked. To reposition a shelf—release the locks, pull the shelf straight out, slide it straight in on its supports at the new location, and press the locks. It takes only seconds to do the complete job.

For complete information, see your Hallowell distributor. Or write Hallowell Shop Equipment Division, STANDARD PRESSED STEEL CO., Jenkintown 49, Pa.

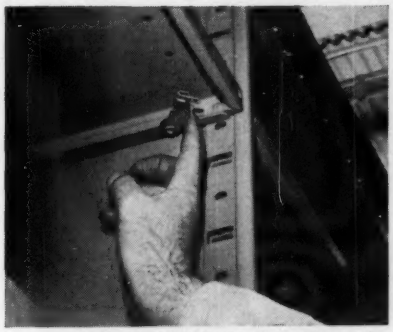
*Patent applied for

TWO MEN ASSEMBLED new Hallowell ERECTOMATIC steel shelving in just over 10 minutes. Closed unit was 36 in. wide, 18 in. deep, 7 ft. 3 in. high, complete with seven shelves. Standard models of other design required from 13-55 min. Table shows test results.

Brand	Time to Assemble (Min.)	Units Per Hour
Erectomatic	10.24	5.75
A	13.23	4.53
B	14.24	4.21
C	16.30	3.68
D	18.12	3.31
E	25.03	2.40
F	55.03	1.09

FAST ASSEMBLY. Just position the shelf supports, insert the shelf, and press the unique locking device. No tools or special instructions necessary.

gives you all these extra-value features



QUICK SHELF CHANGE. Just release the locks, remove the shelf and its supports, relocate the shelf, and press the locks. It takes only seconds.

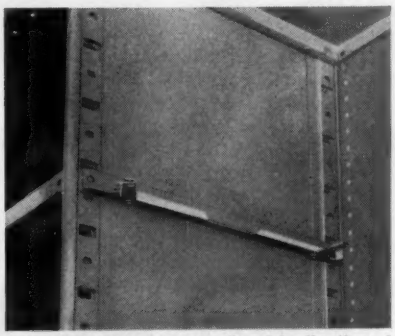
STRAIGHT-IN, STRAIGHT-OUT SHELF CHANGE. No tilting to interfere with any other shelf. No time wasted unloading shelves or removing bin fronts, partial dividers, label holders.

INDEPENDENT SHELF POSITIONING. Each shelf is an independent unit. Can be removed and repositioned without disturbing any other part. All shelves in a rack can be aligned.

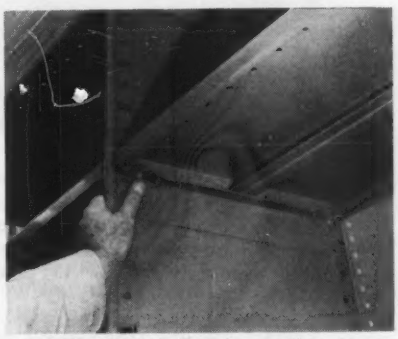
FULL USE OF SHELF AREA. No angles or tees, and beaded corner posts prevent waste of valuable storage space. No box guides are needed.

COMMON SIDE PANELS AND POSTS save assembly time. Also save material between adjacent units in a rack. And both back and side panels are one-piece.

BEADED POSTS AND FLANGED SHELVES prevent snagging of clothing or stored goods. Also prevent injuries from sharp, ragged edges.



FULL DEPTH SHELF SUPPORT. Load is distributed over full depth of shelf. No buckling is possible. Reinforcements can be added when they are required.



4 CLASSES OF SHELVES. Regular, medium, heavy, and extra-heavy shelf construction meets all load requirements. Made to government specifications. Extra-heavy shelf shown.

STANDARD PRESSED STEEL CO.

HALLOWELL® SHOP EQUIPMENT DIVISION SPS

JENKINTOWN PENNSYLVANIA

Circle No. 147 on Reader Service Card for more information

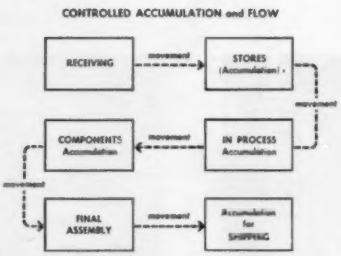
New Ideas
IN MATERIALS HANDLING

A REPORT ON DEVELOPMENTS IN THE INTEGRATION OF — MOVEMENT — TRANSFER — ACCUMULATION *CONTROL

*in this issue "Control"

New handling system has "mechanical brains" to control movement and lower costs

The general concept of the robot has been applied to materials handling in the form of mechanical "brain" controls that give handling systems the ability to make simple decisions. New Rapistan controlled flow systems use these "brains" to coordinate the movement, transfer and accumulation of material under a master plan that transforms floor space into "flow" space.



These systems are based on a new concept. It's one of "controlled accumulation," confined to your absolute necessities in production and temporary storage in plant areas at point of use.

Unique but low cost control devices, combining spur lines, electric eyes, and mechanical accumulators drastically cut your inventory investment by reducing work-in-process. Waste motion is minimized, and judgment errors are eliminated.

This kind of system in your plant automatically moves inventory-in-process to "mobilized storage" in minimum quantities needed to a working area.

Movement of materials is on a first-in first-out basis. Available plant space is used to the nth cube degree . . . even increasing storage capacity as much as 250% and possibly eliminating the need for expensive plant additions.

This is the controlled flow approach to materials handling as practiced by Rapistan idea men. It's a unique approach that assures you lower cost handling than ever before possible.

To learn more about this new approach write today for the free brochure "Controlled" Flow In Action."

Rapistan
Materials Handling Ideas

The RAPIDS-STANDARD CO., Inc.
11 Rapistan Bldg.
Grand Rapids 2, Michigan

Manufactured under license in Europe, Canada and South America

Circle No. 125 on Reader Service Card for more information

USEFUL LITERATURE

Continued

for either airoil (air compressor) or electric operation. Hinged to the dock plate, they provide a "gangplank" between the dock and the bed of a truck or trailer. Globe Trans-O-Matic Ramps have a capacity rating of 20,000 pounds, both for "roll over" and "cross over" loads.

(*Also reviewed in March*)

Circle 269 on Reader Service Card

Heat Sealers for Every Need:

Literature from Doughboy Industries, Inc. describes the firm's complete line of continuous heat sealers and belt conveyors. Rotary sealers are produced for cellophane, glassine and wax bags, foils, laminates and coated papers. Continuous band sealers are offered for plastic films such as polyethylene, vinyls and pliofilm.

(*Also reviewed in March*)

Circle 270 on Reader Service Card

Lift Trucks and Attachments:

Two catalogs, BU-305 describing the complete line of fork trucks, and BU-387 about the line of clamping attachments, are available from Materials Handling Division, Allis-Chalmers Manufacturing Company. Fork lift trucks, towing tractors and Chore Boy platform trucks are illustrated and described. Dimensions and specifications of each unit are included. Photographs of the clamps, side-shifting clamps, rotators and rotating clamps in the new line are included along with dimensions and specifications of these attachments.

Circle 271 on Reader Service Card

Oil Never Wears Out:

A new oil refiner that is installed as an integral part of any internal combustion engine is said to eliminate the need for periodic oil changes. The unit, called the Oilpure Refiner, operates continually, and removes acid, grit and other contaminants from the oil. Engine performance is thereby increased—with a reduction in fuel consumption, parts replacement and downtime. Since oil never wears out (according to the U. S. Bureau of Standards), removal of contaminants is said allow extended use of the same engine oil. Literature describing the Oilpure Refiner is available from C. Raymond Ahrens, Inc.

(*Also reviewed in April*)

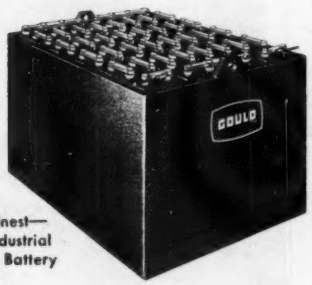
Circle 272 on Reader Service Card

Door-Operator Motors:

A complete line of instantly reversable door-operator motors specially insulated to resist moist air conditions

Pheasant hunting in Tacoma, Washington, where many champion field dogs are raised.

Set Your Sights on Longer Battery Life:



America's Finest—
Gould Industrial
Truck Battery

Here's a tip that may help you.

You can reduce battery costs, save your company money and be better able to judge the comparative value of each make of battery, if you simply keep good battery maintenance records. You will extend battery life by consulting these records frequently, thereby assuring the best possible operating procedures.

Why not talk this idea over with your local Gould representative . . . he will give you easy-to-use maintenance record charts. Gould-National Batteries, Inc., Trenton 7, N. J.

Always Use Gould-National Automobile & Truck Batteries

More Power to you from **gould** BATTERIES

©1957 Gould-National Batteries, Inc.

Circle No. 65 on Reader Service Card for more information

penco—*Equipment that "Wears out Calendars"*

PENCO DESIGNS FOR EXPANSION IN BUSINESS

Penco Steel Shelving relies on its—VERSATILITY and DURABILITY—to follow the patterns of modern business.

Expansion means more than a simple addition to existing facilities. New buildings, remodeled quarters, new machinery and equipment, and new methods make new demands on the quantity and type of storage equipment needed.

In 87 years of service to customers, Penco products have continued to provide the answers under ever-changing conditions.

Penco Steel Shelving is of unit construction which, combined with its standard widths, depths and heights of parts and accessories, makes it easy to change, easy to rearrange, easy to diversify or expand.

All Penco products—Steel Lockers, Cabinets, and Shelving—meet, and in many cases exceed, the requirements of U. S. Federal Specifications. Designed for change . . . designed to endure . . . Penco products are always ready for your expanding needs. Write for Catalog F-57-1.

And There Are Special Services

Planning—Ask for Penco's free engineering service. Let Penco's experience help you in the selection and arrangement of equipment to do the job.

Dependable Service—As a division of Alan Wood Steel Co., Penco is assured a full supply of high-quality steel.

penco
STEEL LOCKERS
CABINETS · SHELVING

penco METAL PRODUCTS DIVISION
ALAN WOOD STEEL COMPANY
Oregon Ave. & Swanson St. • Philadelphia 48, Penna.

Circle No. 120 on Reader Service Card for more information

USEFUL LITERATURE

Continued

for commercial, industrial and domestic applications is described by General Electric Company in its reference publication GEA-6299. These motors are available in ratings from 1/6 through ¾ hp, at 1725 rpm.

(*Also reviewed in April*)

Circle 273 on Reader Service Card

Pulleys For Conveyors, Bucket Elevators:

Complete specifications, drawings and pictures are included in Bulletin 5781 covering welded steel conveyor pulleys produced by Chain Belt Co. Data and features covering drum types and the self-cleaning wing-type pulleys are included.

Circle 274 on Reader Service Card

Standard and Custom Built Trucks:

Literature available from Bowers Industrial Electric Truck Company describes various models of Wright-Hibbard trucks manufactured by the firm. These material handling trucks are offered in a wide range of models which include fork lift trucks, walkies, low lift platform trucks, etc. They are built in standard models as well as special purpose models custom-built to your specifications.

(*Also reviewed in April*)

Circle 275 on Reader Service Card

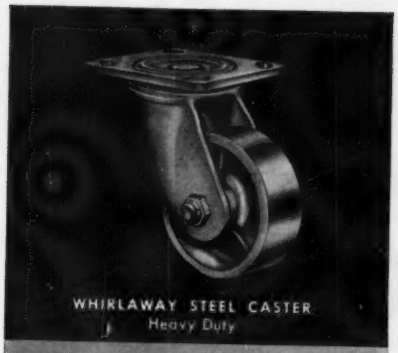
New Catalog on Gravity Wheel Conveyors:

Many models and sizes in 5, 8, and 10 feet sections are illustrated and described in a new "Gravity Wheel Conveyor Catalog" issued by Sage Equipment Company, Inc. Specifications for both aluminum and steel conveyors are included. Curved sections of 45 and 90 degrees, right and left hand switches, gated sections and adjustable stands are available for all models. Hook and pin locking method makes assembly rapid and positive without the use of tools and the slotted design of the connectors allows lateral movement of sections.

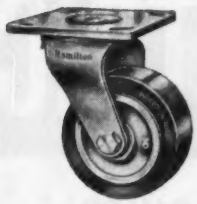
Circle 276 on Reader Service Card

LP-Gas Kit Is UL Approved:

An industrial lift truck LP-Gas conversion kit, which bears Underwriters' Laboratories listing for "approval by report" of a field installation, is described in literature available from The Yale & Towne Manufacturing Company. Basic components of the kit are a fuel tank, fuel filter, LP-Gas converter-regulator, carburetor, solenoid safety shut-off valve, static pressure relief valve and the hoses and connections necessary for

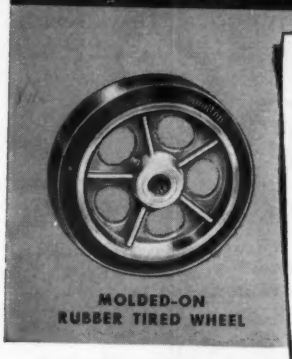


WHIRLAWAY STEEL CASTER
Heavy Duty



FORGED STEEL CASTER
Regular Duty

AIR-FLO STEEL CASTER
Extra Heavy Duty



MOLDED-ON
RUBBER TIRED WHEEL

HAMILTON IS HEADQUARTERS for industrial casters and wheels

If you use industrial casters or wheels—whatever the application . . . whatever the quantity—get a quotation from Hamilton. The Hamilton line is extensive and exceptionally complete. Hundreds of styles and sizes are offered, including swivel and rigid casters of forged steel, plate steel, cast steel, pressed steel and semi-steel. Single and double wheel models. Wide range of capacities—up to 2,500 lbs. per caster.

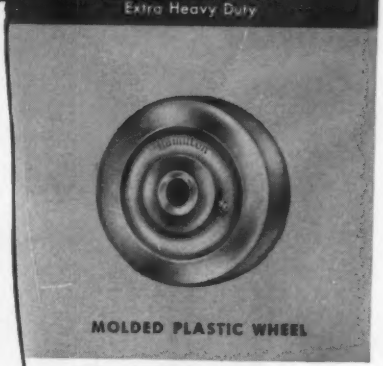
Wheels available include steel, semi-steel, molded-on rubber-tired wheels, renewable rubber tires, full pneumatics, semi-pneumatics, molded plastic and composition rubber wheels. Many are available with choice of bearings, including Hyatt and Timken roller bearings.

Make Hamilton your headquarters for industrial casters and wheels. Write today and tell us your requirements. Prompt quotations.

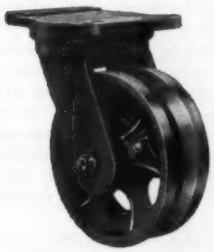
SEND TODAY FOR YOUR COPY OF THE HAMILTON CASTER AND WHEEL CATALOG!

1907 • SERVING INDUSTRY FOR 50 YEARS • 1957

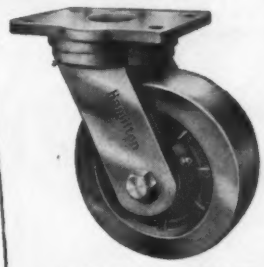
THE
Hamilton
CASTER & MFG. CO.
1672 Dixie Highway Hamilton, Ohio



MOLDED PLASTIC WHEEL



V-GROOVED WHEEL CASTER

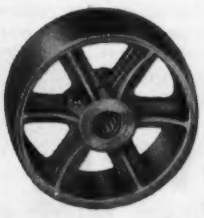


FORGED STEEL CASTER
Extra Heavy Duty

SEMI-PNEUMATIC
TIRED WHEEL

PNEUMATIC TIRED WHEEL

KALBER DOUBLE
WHEEL CASTER



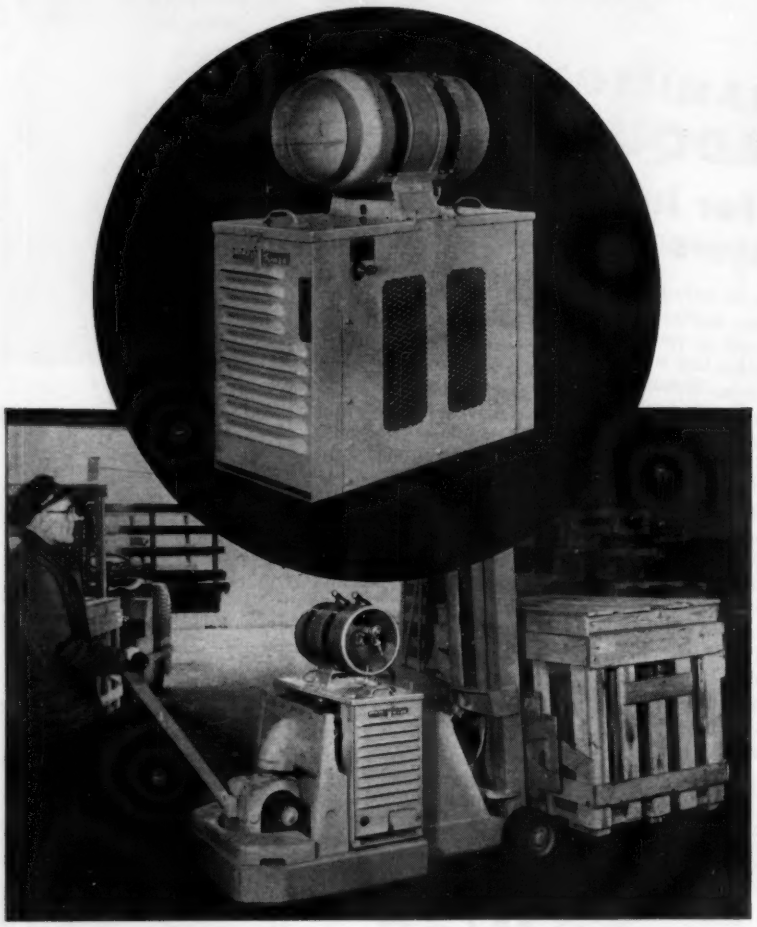
SEMI-STEEL WHEEL

SEMI-STEEL CASTER
Medium Duty

Circle No. 66 on Reader Service Card for more information

LPG-ELECTRIC

The Versatile READY-POWER way!



New! Bantam Model W12 for Electric Powerized Hand Trucks

Ready-Power combines full electric power *with no fatigue* AND the economy and low maintenance of LP-gas in one compact new power unit. Installation is quick and easy on any make of motorized electric hand truck with adequate sized power compartment. Bantam model W12 accommodates an interchangeable 20-pound fuel cylinder, includes a quick-disconnect fuel line coupling for safety, has removable end, side and cover plates for easy accessibility. LP-gas components are listed by Underwriters' Laboratories and comply with Factory Mutual recommendations. It's easy to convert your present trucks to this modern, full-production power. Specify "Ready-Power" when ordering new trucks. Write for information.

READY-POWER

The READY-POWER Co., 3838 GRAND RIVER AVE., DETROIT 8, MICH.

Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electic Power Units for Industrial Trucks

Circle No. 128 on Reader Service Card for more information

USEFUL LITERATURE

Continued

installation. Each Yale kit supplied to a user bears a serial number which gives certification that the conversion, if applied according to proper procedures, has been accomplished in a manner that meets UL specifications.

(*Also reviewed in April*)

Circle 277 on Reader Service Card

Screw Conveyors Off-The-Shelf:

A data sheet providing design details and other information on steel screws, troughs and complete screw conveyor systems has been released by M-H Standard Corp. "Off-the-shelf" deliveries can be made by using parts numbers listed in two tables.

Circle 278 on Reader Service Card

Pile Driver Is Self-Contained:

"Orton Pile Drivers" is the title of a new brochure issued by the Orton Crane & Shovel Company. The literature features the firm's new self-contained, revolving diesel locomotive pile driver with Torque-Control fluid clutch. It gives general operating capacities as well as showing the unit in action. Also described in the same bulletin is the Orton combination locomotive crane and pile driver, a self-propelled machine which uses one power plant to transport and operate two diesel-powered units.

(*Also reviewed in April*)

Circle 279 on Reader Service Card

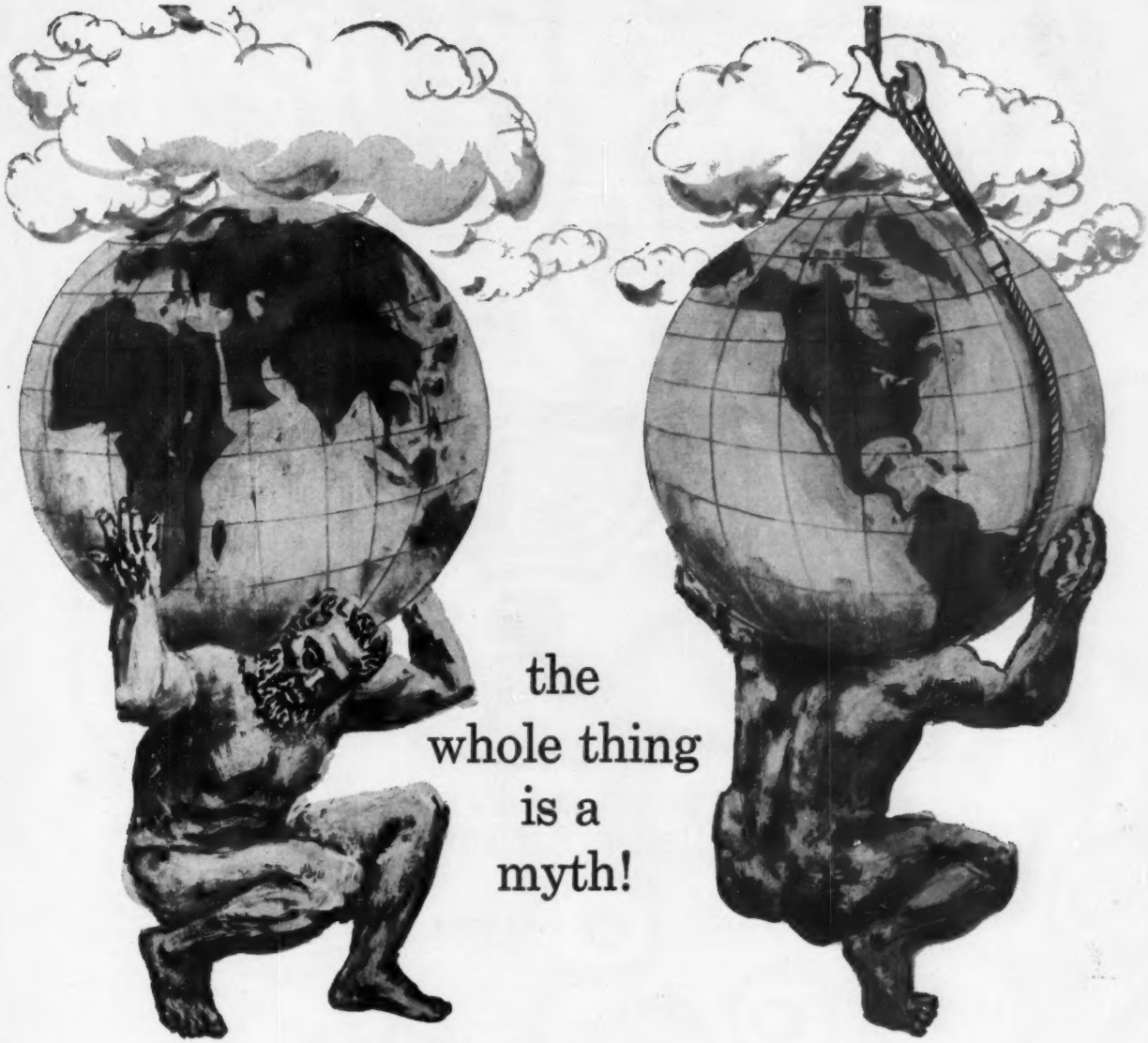
Handles Materials up to 3000 Pounds:

Electric and manual lifting and stacking equipment, as well as special dumping equipment is described and completely illustrated in a four-page bulletin prepared by Uhrden, Inc. Tubar lift trucks, available in capacities of 1000, 1500, 2000, and 3000 pounds are powered by 12-volt batteries and have built-in chargers. The chargers have provisions for 110-volt and 220-volt. They are available with fork, platform or combination lifts and with standard or straddle type legs, all models are equipped with rear swivel casters. Hydraulic stackers, telescopic lifts and other material handling equipment with capacities up to 3000 pounds are also listed.

Circle 280 on Reader Service Card

Increases Hauling Production:

Hourly haul output can be increased by as much as 20 percent, according to a new 24-page booklet on the Dumptor, a product of Koehring Company. On-the-job photos, combined with schematic drawings, show how this ad-



the whole thing is a myth!

...the work is done by a Roebling Sling!

It's a fact that holds true for lifting jobs in almost every industry you can name. The types of slings and fittings that are manufactured by Roebling would fill a book (and they *do*—a 51-page catalog that's yours for the asking).

The endless and often monumental materials handling needs of industry are met, in every respect, by the complete and completely dependable Roebling Sling line. They include: All-Purpose Slings, Grommet, Roegal® Cable-Laid, Flatweave and Railroad Slings; Flatweave Drawbar and Plate-Lifting Slings and a full line of end fittings. Within each of these categories are a variety of sizes, strengths and capacities.

Certain facts apply to all Roebling slings, whatever their use: advanced construction features certify safe, steady service and stability under load.

The new catalog that we'd like to send you is designed to make sling selection and ordering as easy as the job a Roebling Sling performs. Ask for A-931. Meanwhile, if you have any materials handling questions or want further sling information, your Roebling salesman or distributor will hasten to help you out. Write to Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING

Branch Offices in Principal Cities

Subsidiary of The Colorado Fuel and Iron Corporation

Circle No. 135 on Reader Service Card for more information

USEFUL LITERATURE

Continued

ditional work load is made possible by fast spotting, elimination of turns and a 1-second dumping operation.

(*Also reviewed in April*)

Circle 281 on Reader Service Card

History and Products:

The incorporation of a production diesel engine into the crawler tractor and many other "firsts" are described in a booklet, "A Quarter Century of Diesel Leadership," just released by Caterpillar Tractor Company. The booklet tells the story of the Company's many engineering achievements since its entrance into the diesel engine field in 1931. Caterpillar fuel injection system, the development of detergent oils, the induction hardening of cylinder lines and camshafts, the use of aluminum alloy and connecting rod bearings and other developments are discussed.

Circle 282 on Reader Service Card

When Conveyors?

A pamphlet available from Jervis B. Webb Company illustrated and explains several of the various types of conveyors and conveyor systems, manufactured by the firm. It also discusses the conditions under which operations of various kinds should be conveyorized.

(*Also reviewed in March*)

Circle 283 on Reader Service Card

Welded Wire Mesh Containers:

An illustrated 34-page report on how to cut material handling costs is available from Pittsburgh Steel Products, a division of Pittsburg Steel Co. Illustrated case history studies on use of welded wire mesh Cargotainers are included, as well as general information covering the versatility in shipping, warehousing or production. Tables covering sizes and capacity for standard models are presented.

Circle 284 on Reader Service Card

Wheels for Material Handling Equipment:

The advantages of "Disowheel", a wheel for material handling trucks, compared with other wheels, are outlined in a brochure prepared and released by Greer Industries, Inc. The bulletin describes, verbally and pictorially, load capacity, resilience, durability, and reduction in truck power consumption. Results of an on-the-job test of these features are included.

Circle 285 on Reader Service Card

Hand-Operated Tally Counters:

Literature is available from the Faymus Division of Bankers & Merchants, Inc., describing its two new models of hand-operated tally counters. Tally King counters are designed to help carry out a wide variety of counting jobs. Model TK-1 is operated by pressing a button with the thumb, and registers up to 9,999. Model TK-2 is similar, but with a mounting base for attaching to desks, tables, etc.

(*Also reviewed in April*)

Circle 286 on Reader Service Card

Worm Gear Drives:

A sixteen-page, illustrated brochure —Finger Tip Facts on Cleveland Worm Gear Drives—provides useful summary information on the complete standard line of speed reducers, worm gear sets and special units manufactured by The Cleveland Worm & Gear Company.

Circle 287 on Reader Service Card

Report Describes Freight Car Handling Methods:

A performance report, "How Alcoa Increased Unloading Capacity, Freight Handling Efficiency and Furnace Production with 3 Trackmobiles," is being offered by Whiting Corporation. The trucks are used in plant switching, spotting and hauling operations. The report describes the complete operating functions.

Circle 288 on Reader Service Card

FOR ECONOMY IN MATERIAL HANDLING STACKING AND SHIPPING...
BIGELOW-GARVEY
COLLAPSIBLE PALLET BOXES
Fill the Bill
The Hinged-Corner, Super-Strength B-G Pallet Boxes are made in 3 models: A—Plain, B—Open Front, and C—Drop Leaf...a complete line for all types of material handling. No matter what type of product you wish to store or ship, there's a B-G Container that will do the job for you with the greatest of safety, convenience and efficiency.
• ECONOMICAL IN FIRST COST
• CONVENIENT—EASILY STACKED
• COLLAPSIBLE FOR STORING
• STRONG—HANDLE UP TO 5000 lbs.
• REDUCE LABOR and HANDLING COST
• INDIVIDUALLY ENGINEERED
B-G Tight-Corner Pallet Boxes and Special Containers are designed to your specific requirements. Let us help solve your particular handling and shipping problems.
Backed by 33 Years of Special Packaging Experience
Tight Corner Hinge Crate
Wooden Pallets
Model A Pallet Boxes
Model B Pallet Boxes
Model C Pallet Boxes
Kraft Crate
Wooden Boxes
Six Section Panel Crates
MILLS: ARKANSAS GEORGIA WISCONSIN MINNESOTA KENTUCKY
always check
BG
General Office and Laboratory
Write for complete details and prices to...
BIGELOW-GARVEY
lumber company
326 W. HURON STREET • CHICAGO 10, ILLINOIS
Phone WHitehall 4-5252

Circle No. 22 on Reader Service Card for more information

WHEN ONE-HALF OF THE BOXCAR IS EMPTY... THE TL-6 TURNS AROUND INSIDE THE CAR AND UNLOADS THE OTHER HALF

Compact TL-6 TRACTOLOADER® keeps material moving for CHENOA MILLING COMPANY, Chenoa, Illinois

Since there isn't a ramp at Chenoa Milling Company's warehouse (due to railroad restrictions), the TL-6 enters the boxcar containing grain about 200 yards away — where there is a ramp. Car is then moved to warehouse. Here a makeshift bin is fed by the TL-6 and the grain moves into the warehouse on a conveyor. The boxcar stays at the warehouse until it's completely unloaded — no need to move it back to the ramp when half unloaded. The TL-6, with its compact design and short turning radius, easily maneuvers around inside the car to finish its job.

Why not let this ½-yd loader solve your confined-area material handling problems? Get an on-the-job demonstration from your Allis-Chalmers construction machinery dealer.

TRACTO — *a sure sign of modern design*

TL-6 QUICKLY HANDLES OTHER JOBS FOR CHENOA MILLING, TOO!

CARRIES FERTILIZER FROM BOXCAR INTO STORAGE SHED — no losing the load, either, with tip-back bucket. Makes complete cycle without shifting — operator just pushes or pulls a lever to go forward or reverse.

DELIVERS FERTILIZER TO CUSTOMER'S TRUCK — a full bucket every time. TL-6 gets load without ramming with smooth crowding action of hydraulic torque converter drive.

LOADS HOPPER WHEN MIXED FERTILIZER IS ORDERED—elevator transports it to mixer. TL-6 makes hairpin turns into and out of the various bins for the different kinds of fertilizer.

SOLD AND SERVICED BY YOUR ALLIS-CHALMERS CONSTRUCTION MACHINERY DEALER

Send For Free Descriptive Catalog
On The Complete Line Of Tracto-Loaders

TRACTOMOTIVE

TRACTOMOTIVE CORPORATION, DEERFIELD, ILLINOIS

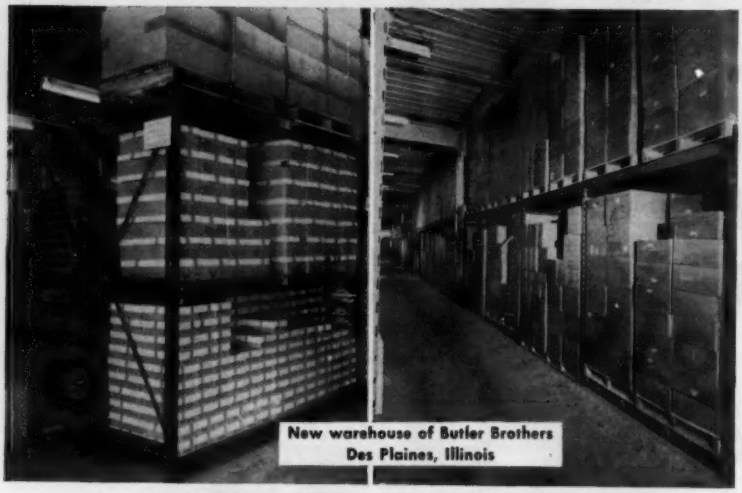
Circle No. 158 on Reader Service Card for more information

TRACTOMOTIVE CORPORATION, Dept. FL
Deerfield, Illinois

☐ Please arrange a demonstration of the TL-6
☐ Send catalog on Tracto-Loaders

Name .....
Title .....
Company .....
Address .....
City ..... State .....

yes ANY STORAGE RACK LETS YOU STACK FOR EXTRA SPACE—



New warehouse of Butler Brothers
Des Plaines, Illinois

but ONLY STURDI-BILT makes storage space SO VERSATILE!

- Quickly erected!
- Instantly rearranged!
- Simply adjusted! • Easily relocated!
- No tools, nuts, bolts or welding!
- No special labor needed at any time!
- No cross bracing of any kind!
- All parts 100% reusable!
- Safe loading of bars up to 8,000 lbs. per pair.

Sturdi-Bilt makes the most of your storage facilities! It doesn't matter what you store — how much, how heavy or how big — Sturdi-Bilt Racks are *simply* adjusted to meet your need.

No "One Way" storage system here — instead you receive complete freedom in types of storage— Pallets, Skids, Dies or Bulk — plus flexibility for variations in size, and economies in set-up and daily use.

Only STURDI-BILT Racks have "Float Wedge Construction"
1. Simply insert Sturdi-Bilt Wedge Lock . . .
2. . . . into the slots in the factory pre-fabricated upright frame . . .
3. . . . and lock to the horizontal safety support bars.
3"
Store from either side — there's no sway or cross bracing.
Space your openings anywhere on 3" centers — simple to place — quickly respaced.
Flush decking design eliminates obstructions for easy placement and removal of goods.

Sturdi-Bilt

U. S. Patent No. 2760650 Other patents pending.

WRITE FOR FOLDER No. F 75

Sturdi-Bilt Engineering Company

2501 Paterson Avenue Chicago 45, Illinois

Circle No. 192 on Reader Service Card for more information

MODULE DECKING . . .

(*Continued from page* 122)

Under this procedure, templates gave a visual picture of the entire warehouse to provide an insight into the effect of any proposed change. When a change was envisaged, our planners checked it by merely moving a small cardboard template a few inches rather than wrestling a 30,000-pound skid across a warehouse.

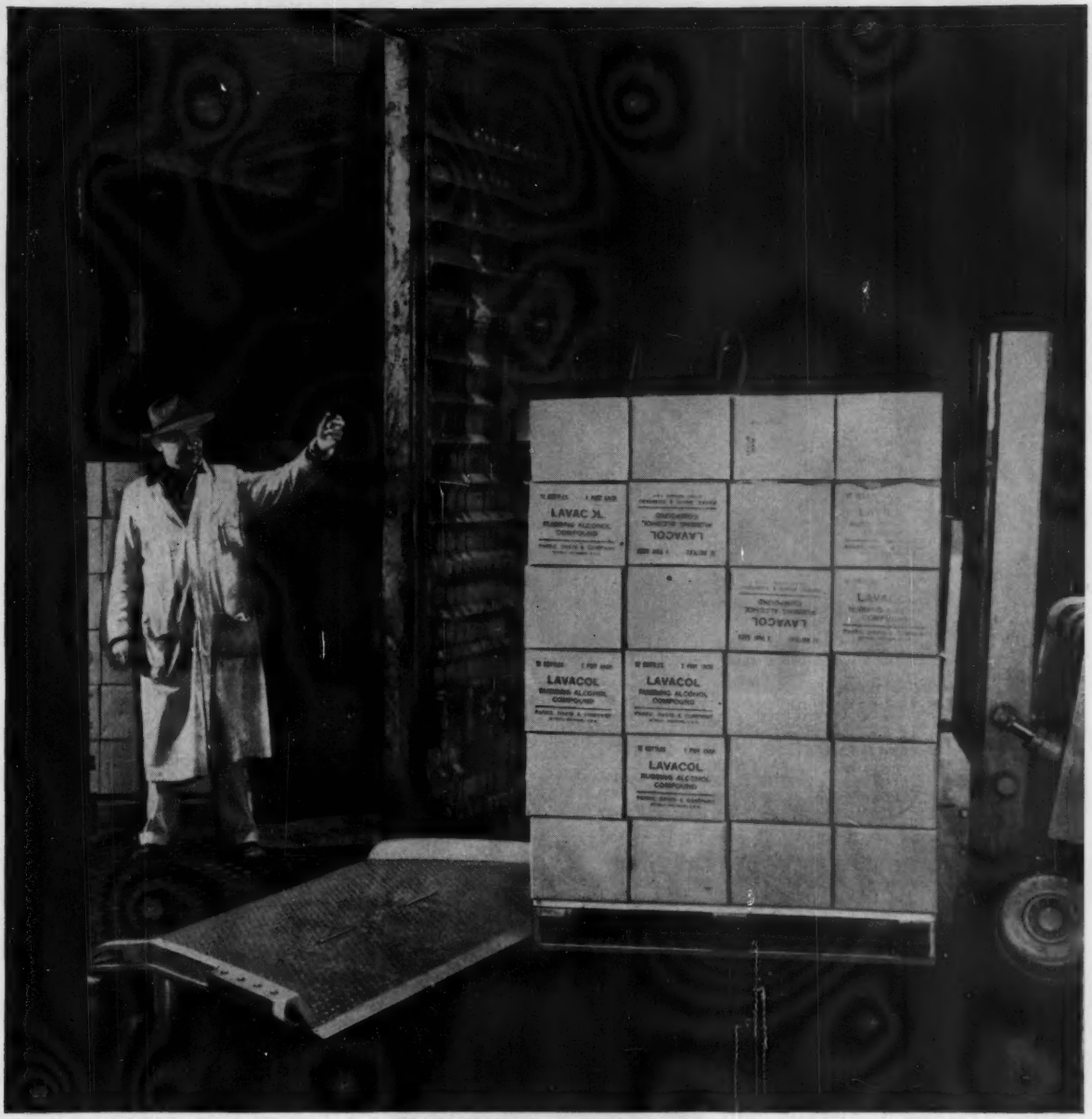
Module Decking

For warehousing, particularly with tools moving in and out, we ruled permanent decking as impractical. In its stead our engineers devised what we call "module decking." Basic element is a reusable, removable, demountable, standardized wooden deck. Prefabricated outside the warehouse, it measures 6 x 6 feet and has a deck which is positioned six feet above the floor. In effect, the module deck forms a second floor.

Module decks are fork truck handled into the warehouse and set one against the other. Though the units are bolted together, they are not bolted (or anchored in any way) to the concrete floor of the warehouse. Bolts are quickly set (and as quickly removed) by an impact tool. A module's 36 square feet of decking can withstand 150 pounds of loading to the square foot and give a floor loading of 1000 pounds to the square foot.

The modules are built from standard lumber. However, instead of using 12 x 12's as jacks (module supports) engineers conceived a laminated support which consists of two 2 x 6's separated by a 2 x 4. When jacks of two adjacent decks are bolted together, they form a laminated 12 x 6.

Thus, we have created a 12 x 6 with the same bearing surface as the larger timber, but with considerably less weight. Laminated construction has another advantage. The 12 x 12's could not be successfully bolted where they meet at corners, but the laminated 12 x 6's can. Additional support is provided to the laminated jacks by use of 2 x 4's which run diagonally, corner to corner. They too



Two PARKE, DAVIS employees can easily handle this light, strong magnesium dockboard.

Parke, Davis moves products over lightweight magnesium dockboards

Materials handling problems vary considerably at Parke, Davis & Company, major pharmaceuticals manufacturer. They're handling fragile 6-ounce bottles one day and ponderous processing equipment the next. But all these shipments have one thing in common, they are moved rapidly and safely over magnesium dockboards.

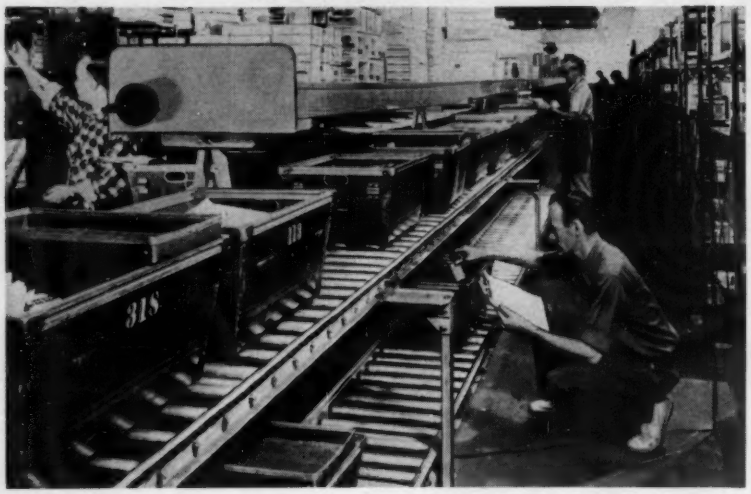
Parke, Davis employees like magnesium dockboards because they're lightweight and easy to lift, carry and position. They are used on both their rail dock and truck docks. (One board is fourteen years old and still in everyday service!) In the picture above, a lift truck weighing over three tons is about to move across a magnesium dockboard.

For lightweight magnesium materials handling equipment —dockboards, loading ramps, hand and platform trucks— contact your nearest supplier. For information about magnesium, contact the nearest Dow sales office or write to THE DOW CHEMICAL COMPANY, Midland, Michigan, Department MA 1410S-1.

YOU CAN DEPEND ON DOW

Circle No. 48 on Reader Service Card for more information

Ask Standard how to cut costs with conveyors



Although over 19,000 items are stocked, conveyors permit fast and efficient assembly, checking and packing — orders ride safely in durable, lightweight tote boxes.

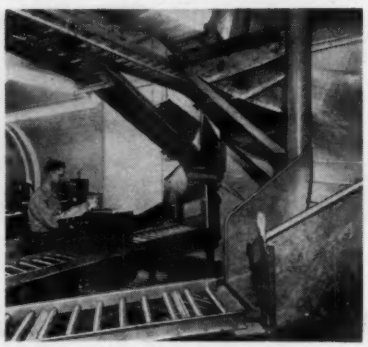
Milwaukee wholesale drug firm

ups order-filling 50% with 3-floor conveyor system

WITH conveyors, The F. Dohmen Company, Milwaukee, Wisconsin, designed a system which has permitted them to fill upwards of 50% more orders per day . . . reduce to a minimum, excessive overtime costs . . . reduce errors, delays and merchandise damage. Standard belt and roller conveyors connect every department in the firm's three-story warehouse.

This installation is typical of what Standard can do to solve material handling problems. Standard designs and builds permanent and portable systems and units, using roller, belt, slat, chain, pushbar or sectional conveyors — power or gravity; also spiral chutes and pneumatic tube systems.

For complete facts, consult STANDARD CONVEYOR COMPANY, General Office: North St. Paul 9, Minnesota. Sales and Service in Principal Cities.



Floor-to-floor route of conveyor system assures minimum wasted motion by employees. Above, "close-out" checker makes final inspection of orders.

For details on Standard Conveyors of all types, contact the Standard representative listed in your classified phone book or write direct. Ask for Bulletin A-5.

Circle No. 146 on Reader Service Card for more information

are bolted in place.

Open end construction permits a module deck to be positioned over a machine tool skid, creating an upper deck. Yet, it allows removal of the lower skid by fork lift, because no cross members interfere with the work.

Module decking has created some 2500 square feet of new storage space, some inside and some outside the controlled humidity area. Another 8700 square feet of bonus warehouse space was picked up simply through careful skid placing, and by elimination of aisles two-foot, or wider which previously separated all skids (when tool numbers were stenciled on the skids.)

Results

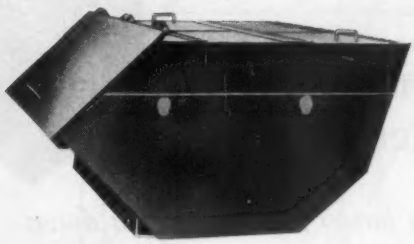
Decking versatility was greatly increased by building with independent units, each having a surface area of six feet square. Each unit was designed so that two jacks, six feet high and six feet long, could be prefabricated outside the warehouse. During installation it was necessary only to fasten 2 x 8 joists to the jacks, then screw down two-inch prebored flooring.

Module decking has other advantages: (1) Except for its bearing on the floor, a deck in no way depends on the warehouse for support; (2) decks can be broken down and rearranged at any time; (3) prefabricated jacks are entirely of bolted construction and are standardized even to diameter and length of bolts; (4) Each decking unit adds 36 square feet on the deck (with maximum loading of 150 pounds per square foot) and 30 square feet of usable storage under the deck, on the floor. Thus, each unit increased usable storage space by 30 square feet.

Our skid location system features eye-level placards, mounted on each skid, whether it is floor-mounted or stored upon a module deck. The placards are unusual in at least three respects: (1) All are standardized—12 inches high, eight inches wide, with four-inch

DISASTROUS FIRES

you can help prevent them by storing and handling materials in fire-resistant LOAD LUGGER CONTAINERS



...another advantage of the modern LOAD LUGGER system

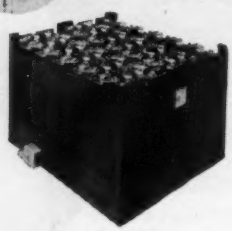
Fire is confined within the steel container, is easy to control and extinguish, often doesn't spread beyond the smoldering stage. The container, fire and all, can be readily moved to a safe area. Consider this Load Lugger advantage when you investigate materials handling equipment. Write today for full information about the Load Lugger system—Load Lugger equipped truck servicing dozens of patented Load Lugger containers. You'll be money ahead.

LOAD LUGGER

LOAD LUGGER, Ingersoll KALAMAZOO DIVISION
BORG-WARNER CORPORATION
1835 North Pitcher Street, Kalamazoo, Michigan, Telephone Fireside 5-3501
EXPORT SALES: BORG-WARNER INTERNATIONAL CORPORATION, CHICAGO

Circle No. 78 on Reader Service Card for more information

No handling freeze-up here...



because no sudden failure here...

an Edison battery won't let you down

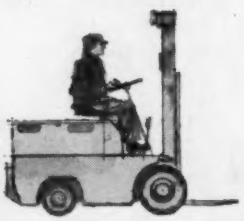
SUB-ZERO TEMPERATURES put an extra burden on material-handling equipment in cold storage rooms. But with EDISON batteries supplying the power, industrial trucks keep the goods moving without interruption.

EDISON batteries have been delivering full-shift power for years in trucks in quick-freeze departments with temperatures as low as 60 below; and they are not subject to injury by freezing at any state of charge.

Under all operating conditions EDISON's exclusive design protects you from sudden failure. Charging is faster and easier. The steel cell construction withstands abuse. And, of particular importance in seasonal operations, EDISON batteries are easy to lay up.

Test after test in all types of trucks shows it costs less to own and operate an EDISON battery. For details call your Edison field engineer, or write: Edison Storage Battery Division, Thomas A. Edison Industries, West Orange, New Jersey.

The truck that never lets you down is electric



Material-handling experts have found that freedom from sudden breakdown enables three battery electric trucks to do the work of four or more trucks with other power sources. For dependable material handling, your most economical combination is a trouble-free electric truck powered by an EDISON battery.

Edison NICKEL–IRON –ALKALINE Storage Batteries

...a product of Thomas A. Edison Industries of McGRAW EDISON

Circle No. 49 on Reader Service Card for more information

black fiberboard; (2) Typed below each of the simplified numbers (they contain three or four digits) is the full serial number of the machine; All placards are at eye-level and uniformly high, depending upon whether they rise from floor-mounted skids or from skids stored on a module deck. All placards stand 4½ feet above the skids on which they are mounted.

From a master tool control index, the warehouse chief can call for any tool, simply by scanning his templated board. Rather than call out the entire number (for example, "get me tool number 3485858696969") he merely asks for "Tool 34." Warehousemen can spot the placards from as far off as 100 feet (and farther). Because tools pertaining to a single end-item are grouped together, a single tool is seldom moved. Uusually, an entire group moves out of the warehouse.

The Ordnance warehouse is a working example of the "Module Decking" concept of industrial storage. With templated layouts and unitized decking, warehouse capacities can be upped by as much as 50 percent while, at the same time, machine movements are minimized. Naturally, variations in these methods and procedures are made to suit type of material stored, length of storage time and size and conformation of available warehouse. The most valuable feature of the method is the pre-planning concept and its adaptation to flexibility in meeting changing requirements.

The article, "How to Reduce Excess Inventory" (FLOW, March '57 p. 90), failed to give credit to the designer of the system. Hillman's Chicago warehouse was designed and engineered by the Ballinger-Meserole Company, Philadelphia, Pa. In preparation of the article, this credit was inadvertently omitted.

THE NEWEST AND BEST IN SHELVING!

KLIP-BILT®

STEEL SHELVING

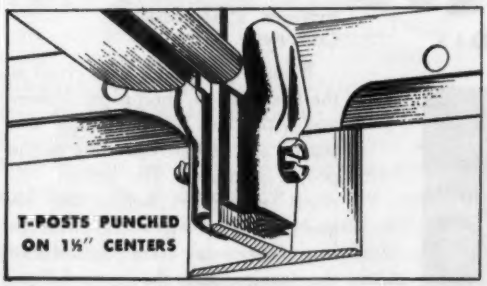
Pat. Pend.

installed fast without tools . . . combines high strength with low installation cost

KLIP-BILT, the revolutionary new boltless steel shelving, provides the fastest, simplest assembly of high strength storage equipment yet developed!

All fastening is with simple clips . . . easily installed by hand yet ingeniously designed to hold shelves, panels, dividers, and T-posts of various thicknesses pressure tight. Clips can be quickly disengaged, too, to permit easy rearrangement or disassembly of shelves.

Manufactured in standard sizes and parts.



SHELF CLIP

Just three parts for quick installation. Hardened cadmium-plated threaded stud and two heavy formed steel clips, one having stamped thread. Holds shelf flange tight against tough, rail steel T-post to prevent shelf from sagging when heavily loaded.

PANEL CLIP

Secures back panels to shelf flanges. Engaged at each shelf level. Quickly and conveniently installed from in front of shelving.

DIVIDER CLIP

Locks into two shelf holes to provide firm anchorage. Clips are flat, do not interfere with storage above or below shelf.

Label holders clip to shelf.

©1955

A SHELF FOR EVERY LOAD

A. For average loads
B. For heavy loads (Front and rear flanges reinforced.)
C. For extra heavy loads (Type B with sides and center reinforced.)

WRITE FOR BULLETIN 701.

The FRICK-GALLAGHER MFG. CO.

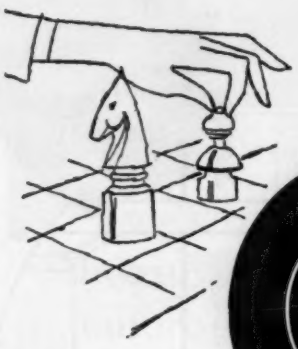
105 S. MICHIGAN AVENUE, WELLSTON, OHIO

Branch Office: 250 S. Broad St., Philadelphia 2, Pa.

Specialists in Storage Planning and Manufacturing of Storage Equipment

Circle No. 58 on Reader Service Card for more information

Coles full circle slewing cantilever boom makes "free cube" storage a paying proposition



Coles works closer to stacks for accurate spotting, maximum SELECTIVITY

COLES

CRANES

JOLIET 2, ILLINOIS

Write for booklet "101 Cost-Cutting Ways."

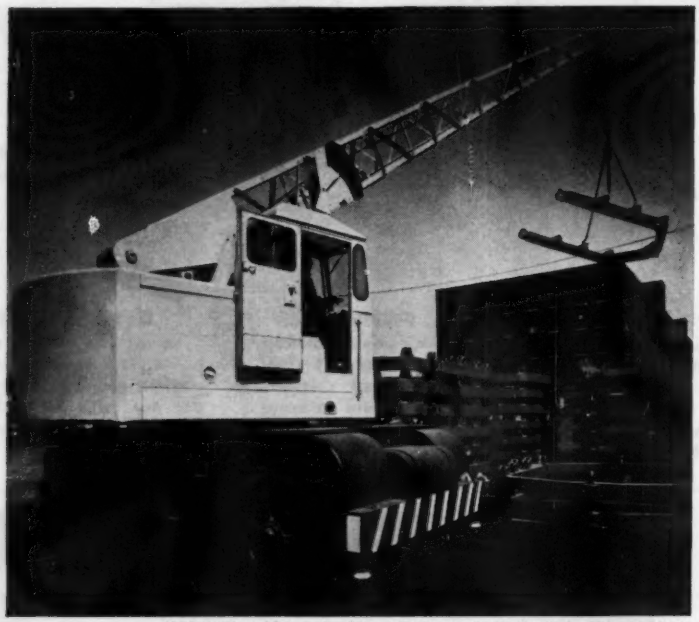


Photo courtesy of International Harvester Company's Tractor Works, Chicago, Illinois

Now, available L.P.G.—diesel or gasoline-electric powered in capacities from 5 to 50 tons. Available on long term lease arrangement, too.

Circle No. 38 on Reader Service Card for more information

CUSTOM DELIVERIES . . .

(*Continued from page 86*)

stations. The operator merely writes in longhand the necessary data taken from the order form, and it is immediately flashed to the five key stations ahead. These are: (1) frame storage, (2) end parts storage, (3) the start of the rotor line, (4) shipping office and (5) production control desk. The transcription gives each of these five stations an actual record of work that has reached the dip and bake station. It signals each of these areas to begin selecting various parts from stock and building sub-assemblies, so that all parts of the order reach final assembly in the proper sequence and at the right time. In this way, operators are always one jump ahead of production—assembling the various parts of a motor while that motor moves toward them through the assembly area. As it reaches each station, the necessary parts are ready and waiting for it.

Frames Placed on Conveyor Line

When the message is received at the first station, the proper frames are withdrawn from storage and placed on the conveyor line in the proper sequence. The stators—already assembled before the sequence was set up on the electronic message relay—are pressed into the frames, and they proceed toward assembly. At the second station, end parts are also sent to assembly, in the same sequence, along overhead conveyors.

The proper rotor cores and shafts are selected from stock at station three, and placed on a pallet. The pallet is loaded onto a powered roller conveyor, still in proper sequence, and sent to shaft and rotor assembly. Rotors are assembled to shafts either by heat-shrink fitting or, on larger units, by forcing on with a heavy press. The assembled rotors and shafts are then conveyed through a cooling tunnel (if they have been assembled by heat-shrink) to the next station. Here rotor and shaft assemblies are placed between centers and any bent shafts are straightened. Still using the same

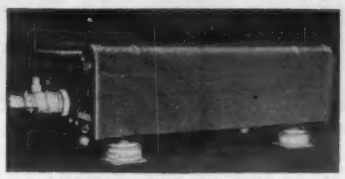
RCA Carfone ONE FIFTY 2-WAY RADIO

This practical forklift truck mobile radio equipment has been specifically designed by RCA engineers for industrial use. For safety in your plant, microphone, loudspeaker and controls are mounted in front of driver. Shock mounts protect radio equipment from shock and vibrations encountered over rough terrain. Re-entrant weatherproof loudspeaker assures more effective sound direction, and noise-cancelling microphone keeps surrounding noise from being transmitted with message. Weatherproof zippered case permits operation in all weather. Superior performance, lower operating costs are assured through RCA's advanced engineering and built-in features.

EQUIPMENT FOR GASOLINE VEHICLES has 6/12 volt convertibility operating directly from a 6- or 12-volt battery without need for current-wasting voltage converters.

EQUIPMENT FOR ELECTRIC VEHICLES has 24/32/36 convertibility, without requiring current-wasting converters.

FORWARD VISION CONTROLS



ROUGH RIDING CONDITIONS

NOISY LOCATIONS

Write today for more information on the new RCA Carfone "150" Industrial Mobile FM Radio for gas or electric use, RCA Department S-131, Building 15-1, Camden, N. J.

RCA

Tmk(s) ®

RADIO CORPORATION of AMERICA

COMMUNICATIONS PRODUCTS

CAMDEN, N. J.

In Canada: **RCA VICTOR Company Limited, Montreal**

Circle No. 123 on Reader Service Card for more information

CUSTOM DELIVERIES

Continued

pallet, the balanced rotating element is conveyed to bearing assembly, where bearings are placed on the shaft. The rotating unit is now ready to proceed to the final assembly area, and the original sequence is still intact.

The elapsed time for the operations on the rotor line—about 2½ hours—is the same as that for the stator and frame line. Consequently, all the sub-assemblies and parts for a particular order arrive at the right time, and in exactly the right order for final assembly.

So far, stators have been pressed into frame assemblies, rotor assemblies are completed and end parts delivered. All these parts, now in sequence, are converging at the assembly area from various locations.

At the assembly area, rotors and stator assemblies ride on roller flight conveyors, on specially designed wooden pallets. The stator and frame assemblies arrive on one pallet, rotors on another, and end parts by overhead conveyor. Bolts, washers and other small parts are stored at the final assembly area in bins and shop boxes. Motors are actually assembled on the pallets that contain the frame assemblies, and the rotor pallets are take away by a separate overhead conveyor.

After the motor is assembled, it continues on to the inspection station. Here it is checked carefully for any mechanical faults.

Motors Move Continually

Even during inspection, the motors are always on the move. An operator connects each one to an electric feed rail, where they are run in while moving down a conveyor to a test stand. At this point they are given a no-load test and, still moving, sent along the conveyor to the shipping department.

At the shipping station, the motor conduit boxes are assembled, keys attached to the shafts, and the exposed surfaces covered with rust-preventative compound. The motors, still palletized on the conveyor, go through a paint spray booth. At this point they are removed from the pallets, which are returned for re-use by overhead conveyor. If no special paint is specified, they are painted Reliance green. Those units requiring special paint are sorted out onto a special conveyor line and moved to a separate paint booth.

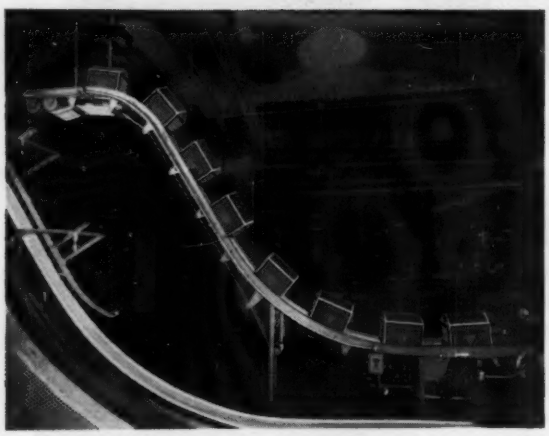
After painting, the motors are placed on shipping department pallets. They are moved to the shipping office, where the factory order papers are removed, identification tags attached, and final work begun on the shipping papers.

Perhaps the ultimate in simplicity is reached here. The conveyor line is directed past the shipping clerk's office. The clerk simply reaches out the window as each motor goes by, and attaches the shipping instructions without getting up from the desk.

Next the motor is crated—either in a wirebound box or in a rugged corrugated container. By the time it reaches the shipping dock, the shipping papers have

A-F ENGINEERED "Magnetic" BELT CONVEYOR

with special A-F *Engineered* Drive . . .
Replaces old fashioned
Pusher Bar Booster



Only A-F
Engineered
Conveying
Systems
Can Give You
A-F *Engineered*
Savings!

Another example of how A-F Engineering combined with A-F ingenuity speeds production — cuts costs.

If *you* want to make the one kind of year-after-year savings now possible — *operational* savings — you owe it to your company to investigate the efficiencies possible through a plantwide A-F *Engineered* analysis of *your* products handling methods.

It may be time for you, too, to replace obsolete conveying equipment with A-F "Engineered Movement". Reduced operating and maintenance costs —plus increased plant and worker output—could well justify the investment.

Write for our Bulletin of Engineered Conveying systems today!

YOU CAN SEE
THE SUPERIORITY OF
A-F CONVEYOR ENGINEERING

A-F

A-F *ENGINEERED*
CONVEYING SYSTEMS
Also Pre-Engineered Conveyors—
Wheel, Trolley, Roller, Belt
Metal Cleaning and Processing Machines

THE ALVEY-FERGUSON CO., 435 Disney St., CINCINNATI 9, OHIO and Azusa, California
Circle No. 4 on Reader Service Card for more information

YOUR WAREHOUSE CAN LOOK LIKE THIS...

HANDLE, TIER *and* STORE ECONOMICALLY, EFFICIENTLY *and* SAFELY *with*

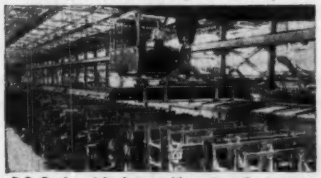
CONSULT P-S FOR THE BEST

PORTABLE *Heavy Duty* BAR RACKS

P-S Rack pick-up by PALMER-SHILE AUTOMATIC TONGS suspended from overhead crane.

Item No. C-497

P-S Racks have flush top and bottom, with full wrap around crane bars. In addition to the full wrap around crane bars, an extra thickness of lift bar is welded for strength and safety.



P-S Racks picked up with automatic tongs—tiered to any height from cab operated bridge crane.

P-S Racks are design-adapted for simple selection using overhead crane.

Why do it the OLD WAY? . . . an investment in ultra-modern Palmer-Shile portable heavy duty bar racks will pay off many times over by eliminating inefficient, money-wasting stock handling and storage methods.

Besides making it so simple, so convenient and safe to tier and store all kinds of bar, sheet, pipe, tubing and other stock, P-S racks also act to prevent damage to stock from the time it arrives at your plant through every handling and storage step.

Flush bottom insures sturdy, rigid, safe tiering—rack upon rack. Heavy gauge steel safety stacking pockets on rack corners eliminate danger of rack slipping or falling. Double thickness lifting lugs welded to wrap around channels, for maximum strength and safety.

Engineered-built to your size and weight specifications. Let our engineers explain how P-S racks add to the efficiency and economy of your manufacturing operations.

DESIGNED AND MANUFACTURED BY

Palmer-Shile Co.

16012 Fullerton Avenue, DETROIT 27, MICHIGAN

126 Dartmouth St., BOSTON 16, Mass., COmmonwealth 6-0570 • 1209 Burlingame Ave., BURLINGAME, Calif., Diamond 2-0823 • 13 South Austin Blvd., CHICAGO 44, Illinois, AUstin 7-8599 • 857 Leader Bldg., CLEVELAND 14, Ohio, SUperior 1-3235 • 3301 Walnut St., DENVER 5, Colo., Alpine 5-3984 • 202 Genesee Bank Bldg., FLINT, Michigan, CEdar 8-6881 • 2609 S. Broadway, FORT WAYNE, Indiana, KEnmore 5408 • 835 No. Capitol Ave., INDIANAPOLIS 4, Indiana, MElrose 5-2587 • 6440 Fleet St., LOS ANGELES 22, Calif., RAymond 3-3733 • 5107 Columbia Ave., ST. LOUIS 9, Mo., PRospect 1-1474 • 199 Main St., WHITE PLAINS, N. Y., White Plains 6-1334.

Circle No. 117 on Reader Service Card for more information

Circle No. 40 on Reader Service Card for more information

AT NO EXTRA COST!

Only Grip-Master® SPROCKETS HAVE HARDENED TEETH to 7" in diameter ★

★ YOU CUT OPERATING COSTS!
Because hardened teeth means better resistance to shock loads and abrasion, you get longer chain drive life "on-the-shaft."

★ YOU SAVE MAINTENANCE COSTS!
Sprocket replacement costs are reduced about 30%. Hubs or bushings can be used over and over, with installation and removal fast, clean and simple.

★ YOU SOLVE DELIVERY PROBLEMS!
Grip-Master Sprockets are available "off the shelf" for quick delivery. Cuts space and storage costs for you.

For complete details, *write today* for your Grip-Master Sprocket brochure.

cullman
POWER TRANSMISSION ROLLER CHAINS AND SPROCKETS
33486

CULLMAN WHEEL CO. • 1335 Altgeld Street • Chicago 14, Illinois

Circle No. 165 on Reader Service Card

TRAY-HART. CYLINDER CARRIER

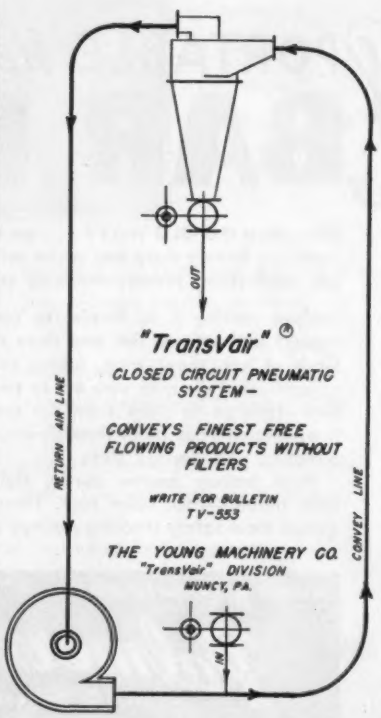
EASY!
SAFE!
SURE!
LOW COST CYLINDER HANDLING

CARRIER IS DESIGNED FOR ALL LIFT TRUCKS. Positive grip, hydraulic release. Handles all sizes and types of cylinders. Capacities from 4 to 24 cylinders.

TRAY-HART. DRUM CARRIERS
INSTALL EASILY ON ANY STANDARD LIFT TRUCK
Rental Facilities Available. Write for complete details.

MANUFACTURED BY
WALZ & KRENZER, Inc.
22 FLINT STREET
ROCHESTER 8, N. Y.

Circle No. 173 on Reader Service Card



CUSTOM DELIVERIES

Continued

been completed and the motor is ready to be shipped to the customer.

Equipment Notes:

Batteries—*Thomas A. Edison Industries, McGraw-Edison Co.*

Bins—*The Frick-Gallagher Mfg. Co.; Stackbin Corp.*

Boxes, Shop—*Union Metal Mfg. Co.*

Containers, Shipping—*Cozier Container Corp., The American Box Co.*

Conveyors, Belt—*The Rapids-Standard Co., Inc.*

Conveyors, Gravity Roller—*Lamson Corp.; Samuel Olson Mfg. Co., Inc.; The Rapids-Standard Co., Inc.*

Conveyors, Live Roller—*Lamson Corp.; The Rapids-Standard Co., Inc.*

Conveyors, Overhead—*Lamson Corp.; Mechanical Handling Systems, Inc.*

Conveyors, Slot—*May-Fran Engineering Co., Inc.*

Conveyors, Vibrating—*Carrier Conveyor Co.*

Conveyorized Storage Racks—*Matthews Conveyor Co.; The Rapids-Standard Co., Inc.*

Electronic Message System—*Tel-Autograph Corp.*

Fork Trucks, Electric—*Big Joe Mfg. Co.; Lewis-Shepard Products, Inc.; The Moto-Truc Co.; The Yale & Towne Mfg. Co., Inc.*

Fork Trucks, Gasoline—*Towmotor Corp.*

Hand Trucks—*The American Pulley Co.*

Hoists—*Chisholm-Moore Hoist Div., Columbus-McKinnon Chain Corp.; Shaw-Box Crane & Hoist Div., Manning, Maxwell & Moore, Inc.; Robbins & Myers, Inc.*

Hoppers, Portable—*Roura Iron Works, Inc.*

Monorails—*The Louden Machinery Co.; Whiting Corp.*

Shelving—*The Frick-Gallagher Mfg. Co.*

Steel Strapping—*Acme Steel Co., Steel Products Div.*

Sweepers, Floor—*G. H. Tennant Co.*

Circle No. 130 on Reader Service Card

"77% greater production using P&H Zip-Lift Hoists"

—reports Wisconsin Motor Corporation

Outstanding production increase coupled with maximum safety

Production rates were boosted and work eased when P&H Zip-Lift® hoists were installed at The Wisconsin Motor Corporation. For example, on one operation, crankshaft milling, "—average output was 15 pieces an hour at a labor cost of 21¢ per piece. Now, using one P&H Zip-Lift, production has increased to 26½ pieces per hour —or 77%. We save 9¢ per piece on labor alone, or $16.66 on each 7-hour shift."

Other records reveal similar increased efficiency and safety wherever each of the 9 Zip-Lifts used by this company is located.

P&H top performance is coupled with maximum safety. In over three years operation, Wisconsin Motors has never had an accident with a P&H Zip-Lift. What's more, the press of a button replaces manual lifting . . . eases labor . . . lowers fatigue.

Find out how P&H Zip-Lift electric hoists can help save you time, labor, and money. Write today for Bulletin H-20. Dept. 206B, Harnischfeger Corporation, Milwaukee 46, Wisconsin.

HARNISCHFEGER

P&H INDUSTRIAL DIVISION

MILWAUKEE 46, WISCONSIN

Circle No. 68 on Reader Service Card for more information

Circle No. 130 on Reader Service Card

REVOLVATOR
GO-GETTER
The MOST COPIED
LIFT TRUCK
On The Market
EASIEST WALKIE-TRUCK TO OPERATE AND MAINTAIN EVER!
FINGER-TIP CONTROLS, INCLUDING DYNAMIC BRAKE TO ELIMINATE "PLUGGING" THE MOTOR GOING DOWN RAMPS, AND "ARTICULATED" CONSTRUCTION ADJUSTS TO UNEVEN FLOORS, STEERS EASILY, AND WORKS IN LESS SPACE BECAUSE OF THE DUAL WHEELS & DIFFERENTIAL DRIVE!
HOW ABOUT MAINTENANCE?
SNAP THE LATCH AND LIFT OFF THE COVERS - YOU DON'T EVEN TAKE THE MOTOR OUT TO GET AT THE BRUSHES, AND THE DISK BRAKE HAS A SIMPLE SCREW ADJUSTMENT
WRITE FOR OUR FREE TRUCK INDEX OF GO-GETTER ELECTRIC AND RED GIANT HAND LIFT TRUCKS
REVOLVATOR CO.
8739 Tonnelle Ave., North Bergen, N.J.

Standardized, Pre-fabricated . . . Easily Assembled in the Field

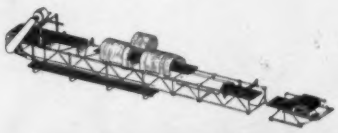
CONVEYORS for bulk handling can be assembled at the job site through the use of pre-fabricated sections recently introduced by Joy Manufacturing Company. Called the Ready-Span System, the conveyor consists of standardized sections of various length, bolted together in any arrangement at the site to make up the total length required.

Each section is made up of four 1½" pipe cords connected by ¾" diagonals to form a laced frame truss. Vertical and horizontal diagonals are bolted to the cords. The resulting truss provides a rigid support for the unit.

All accessories—idlers, walkways, cover decking, hoods, supports and special items—clamp to the pipe for location as desired. Idler spacing can be varied to suit, and other items may be added at a later date without burning holes.

Drives and terminals are adaptable to a variety of pulley sizes, motor mounts, wipers, hold-back brakes, takeups, etc. The trusses are available in all standard belt widths, and in two depths: 24"c/c for spans up to 50 feet, and 42" c/c for spans up to 100 feet.

Any standard troughing idler with mounting holes 9" wider than the belt can be used with the Ready-Span conveyor.



Circle No. 194 on Reader Service Card

ASHWORTH
NEW
OMNI-FLEX
BELT
ECONOMICAL • FLEXIBLE
Let your production ride around corners on the new low cost OMNIFLEX belt. Short turning radius, light weight, easily installed and maintained.

ASHWORTH BROS., INC.
WINCHESTER, VIRGINIA

Sales Engineers: Atlanta • Buffalo • Charlotte, N. C. • Chicago • Cleveland • Dallas • Detroit Greenville, S. C. • Los Angeles • Louisville • New York • Philadelphia • Rochester Seattle • St. Louis • St. Paul • Canadian Rep., PECKOVER'S LTD., Toronto • Montreal

WRITE FOR ILLUSTRATED CATALOG OMF-56

Circle No. 181 on Reader Service Card for more information

HOW CADY PALLET LIFTERS MAKE AERIAL FORK LIFTS OUT OF CRANES AND HOISTS

Users by the hundreds are now lifting, transporting and stacking palletized loads with their cranes and hoists. New savings in non-productive costs are made possible with Cady Pallet Lifters.

at 1/10th the Price of Fork Trucks

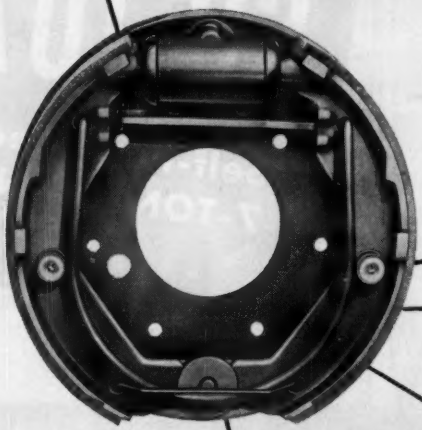
They speed up loading and unloading open top trucks, gondolas and ships. Hundreds of uses in plants and warehouses . . . provide added storage in crane areas and unpaved yards. Counterbalanced to hang level, rigid alloy box frame, light weight allows maximum payload, long maintenance-free operation proved and approved by the Who's Who of Industry. Standard models 1 to 8 ton capacities, also adjustable fork and custom models for handling coils, drums, sheets, welding rod and an infinite variety of unit loads. Write or phone JAckson 4145, N. Tonawanda, N. Y., for Specification Sheet 1056 and name of distributor.

CADY Metal Fabricating Co.
78 Schenck St. North Tonawanda, N. Y.

Circle 182 on Reader Service Card

IF IT MOVES WE CAN STOP IT!

TDA® BRAKES



...for every industrial application where heavy-duty braking is required!

FSH... Floating Shoe Hydraulic Brake designed for close control with heavy loads

The FSH Brake was originally designed to meet certain government specifications *so demanding* that existing brakes could not fill the bill. Now it is available in a wide range of sizes for dependable control application on materials handling equipment.

Unequalled stopping power and control are characteristic of the FSH Brake. The brake shoes operate with a floating action. This permits the shoe to follow the contour of the drum . . . eliminates the danger of liner loads concentrating at one point. The result of this even load distribution is a highly dependable, controllable brake . . . *in either direction* of travel. This is most important when stacking heavy loads at high levels and maneuvering in close quarters.

Mechanical Parking Brake Hook-up

A separate parking brake is no longer necessary with the FSH. If specified, the FSH Brake can be furnished with a mechanical parking brake linkage that functions independently of the hydraulic system.

Long Life Lining

Brake lining is bonded to the shoe to give maximum lining area with no lining waste.

Positive Automatic Adjustment

One application of the foot pedal sets the automatic adjustment. No further adjustment is required during the life of the lining. Optional on some sizes.

Positive Contact Drum Seal

For applications where a sealed brake is required, the FSH is designed to incorporate a seal between the brake backing plate and brake drum.

TIMKEN Detroit BRAKES
TIMKEN-DETROIT BRAKE DIVISION
ROCKWELL SPRING AND AXLE COMPANY
ASHTABULA, OHIO
Accepted DA Standard

©1957, RS&A Company

For every industrial, agricultural or automotive application where braking is required!

TDA Plants at: Detroit, Michigan • Oshkosh, Wisconsin • Utica, New York
Ashtabula, Kenton and Newark, Ohio • New Castle, Pennsylvania

Timken-Detroit Brake Division
Rockwell Spring & Axle Company
Dept. F-57, Ashtabula, Ohio

Please send me further information on your "FSH" Brake.

Name_____ POSITION

Company_____

Address_____

City_____ State_____

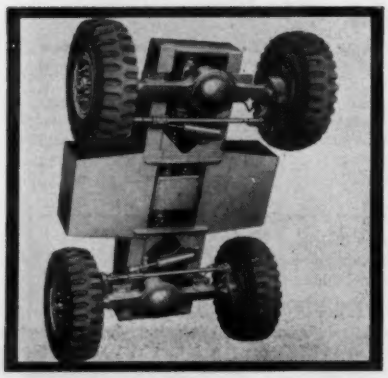
Circle No. 155 on Reader Service Card for more information

The most agile, maneuverable, cost-cutting

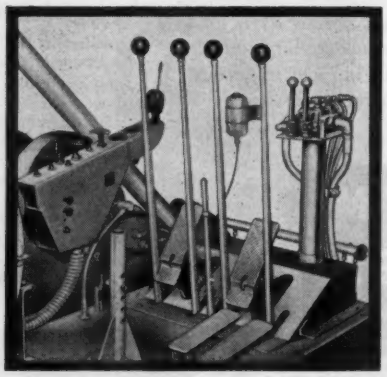
LORAIN

SP-107

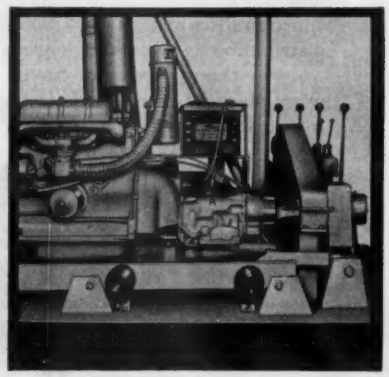
Self-Propelled 7-TON CRANE



STURDY CARRIER DESIGN
This underneath view shows the rugged cross frame and 2-axle steering arrangement (extra). This Carrier is designed expressly for the "SP-107." Hydraulic power brakes are standard.



HYDRAULIC CONTROLS
Here are the convenient and easy-acting "SP-107" controls that actuate the *7 identical* hydraulic clutches. To speed crane handling cycles, *you can hoist, swing and travel—all at the same time.*



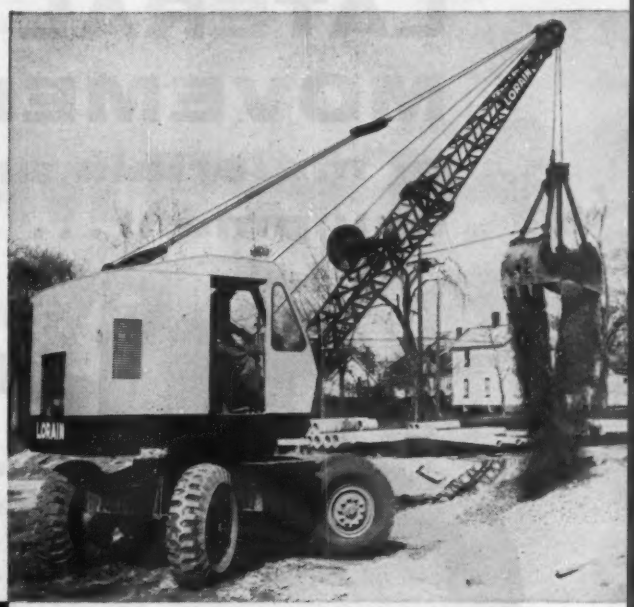
THROTTLE LOAD CONTROL
A Torque Converter power take-off (in connection with the automatic transmission) enables operator to get precision load lowering by "throttle control." Also provides automatic adjustment of engine torque to travel and load demands.

material handling crane you have ever seen!

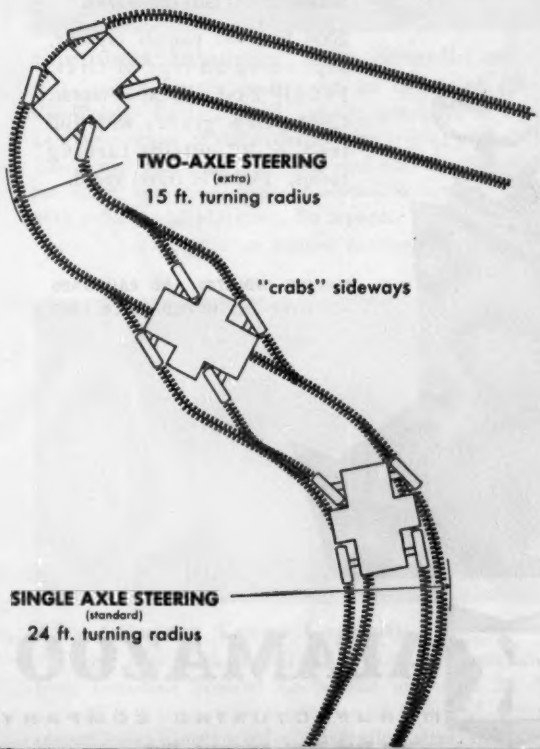
4-WHEEL DRIVE
2- OR 4-WHEEL STEERING
nothing like it in the field today

Here's mobility and maneuverability in a yard crane such as you've never seen. The Lorain SP-107 Self-Propelled Crane embodies an entirely new type Carrier that can turn shorter, can "crab" sideways.

Within the streamlined turntable, you will find typical Lorain quality features—such as hydraulic clutches, independent travel, and torque converter power take-off. Most important, you will find the "SP-107" in a price class that will justify most any plant putting one to work. Ask your Thew-Lorain Distributor to give you the story on the "SP-107."



TURNS SHORT—"CRABS" SIDEWAYS
No other machine can maneuver like this...



HANDLE MANY MATERIALS

The "SP-107" can be equipped with 6 interchangeable front ends—crane, magnet, clamshell, dragline, shovel or hoe—to handle anything from steel to sand. Clamshell is shown above.

CHECK THESE NEW "SP-107" IDEAS

• No Outriggers—Pick up the Load—and Go
Carrier is 8 ft. wide with 8 ft. wheelbase. This close-coupled "square" design gives you the *full rated* lifting capacities throughout the 360° swing—eliminates the need for setting time-consuming outriggers.

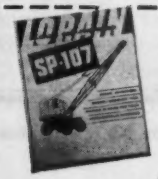
• New—4-Wheel Drive
Powerful 4-wheel drive provides maximum tractive effort to take the "SP-107" anywhere you want to go... plenty of drawbar pull to push or pull trailers. Big tubeless tires give flotation for travel over any terrain.

• 3 or 6 Travel Speeds
You may choose either 3 or 6 travel speeds, applied through a smooth, automatic transmission. Travel speeds up to 15 m.p.h.

• Shorter Turns Save Space
See the diagram at left—for the newest idea in maneuverability. Shorter turns convert turn-around space to storage area. The "SP-107" with 2-axle steering (available) can work in closer quarters, save time when moving into position. Hydraulic power steering is standard.

THE THEW SHOVEL CO., LORAIN, OHIO

THEW LORAIN®



SEND FOR NEW SP-107 CATALOG
Get a copy from your nearby Thew-Lorain Distributor, or write to The Thew Shovel Co., Lorain, Ohio.

Circle 153 on Reader Service Card

for low-cost LATERAL MOVEMENT of materials and equipment...

KALAMAZOO

KALAMAZOO SPEED TRUCKS

Model E-1900 Low-bed Electric

Capacity, 2000 pounds. Weighs only 1025 pounds, less batteries. Climbs 17% grades with capacity load. 75" turning radius. 6.5 MPH loaded, 8 MPH empty. 24 volt or 32 volt motor. All-welded steel body and frame. Available in special models.

Model 2500 Gas-powered

2000 to 3500 pounds capacity, depending on type of tires. 14.6 HP 2 cyl. air-cooled motor. Climbs 20% grades with full load. 6'-9" outside turning radius. 15 MPH travel speed.

SERVING INDUSTRY AND RAILROADS ALL OVER THE WORLD SINCE 1883

Scores of industries enjoy the economies afforded by versatile, self-propelled Kalamazoo materials handling machines. It will pay you to investigate Kalamazoo.

Please send details on the following:

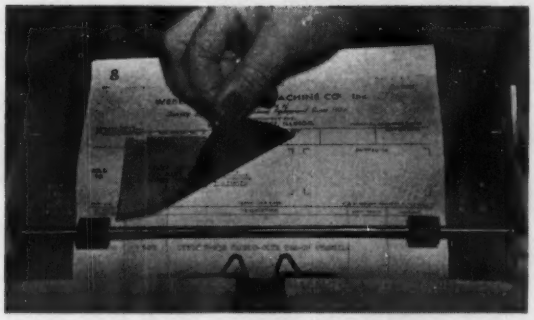
☐ Model E-1900 Electric Speed Truck
☐ Model 2500 Gas-powered Speed Truck

Name_____
Title_____
Company_____
Street_____
City_____ Zone____ State_____
FL97

KALAMAZOO
MANUFACTURING COMPANY
2045 Reed Street, Kalamazoo, Mich.

Circle No. 84 on Reader Service Card for more information

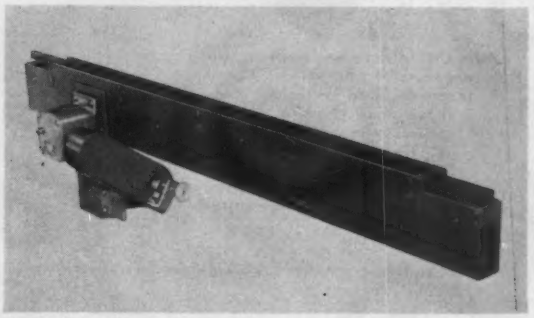
New EQUIPMENT SECTION



Combines Invoicing with Stencil-Cutting

A special carbon coating on its underside allows the Weber "Carbon-Cote" Tab-On stencil to be typed as a by-product of the order-invoice typing procedure. The typist addresses the form and cuts the stencil in the same operation, and the stencil is ready for use with a Weber handprinter. No separate carbon is used.

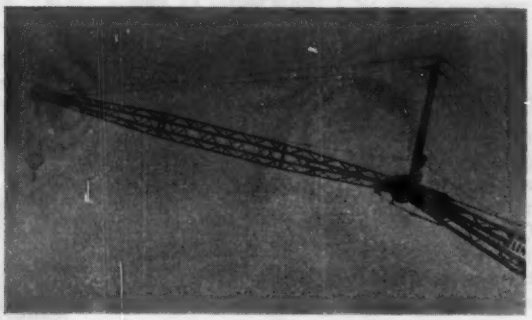
Circle 289 on Reader Service Card



Speeds Movement Between Machines

Movement of cylindrical in-process pieces between machines is speeded up by a new adjustable transfer table developed by Production Feeder Corp. The Model #1000 unit handles pieces from $\frac{1}{8}$ to $1\frac{9}{16}$ diameter, at speeds from 5 to 50 feet per minute. Each includes chain belt, motor, transmission and controls.

Circle 290 on Reader Service Card



Jibs Increase Crane Capacity

Three new high-capacity jibs are now available from Link-Belt Speeder Corp. The units are 20, 30 and 40 feet long, with capacities of 6, 5 and 4 tons respectively. Constructed of high-alloy steel, the basic jib is a 20 foot, all-welded box lattice unit. It can be extended by addition of one or two 10-foot extensions.

Circle 291 on Reader Service Card

For Low Temperature Service

Special adaptations make it possible to operate the Aisle Saver stand-up fork truck in extreme cold temperatures, such as cold storage. Drive and pump motors are specially insulated, and low-temperature oils and lubricants are used, for temperatures of —5°F. The Aisle Saver is produced by Barrett-Cravens Co.

Circle 292 on Reader Service Card

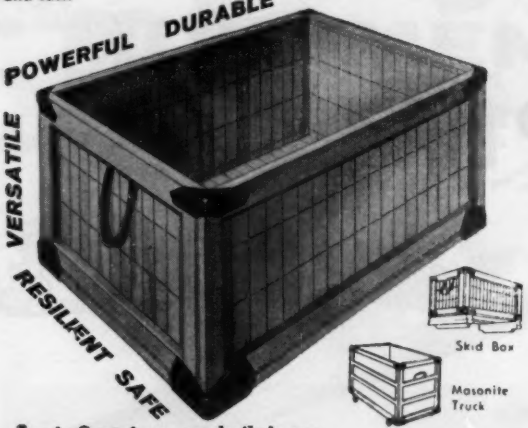
Circle 91 on Reader Service Card for more information

if it's service you want

These durable Lewis Woven Wood-and-Wire Containers will last . . . and last . . . and last!

POWERFUL DURABLE LIGHTWEIGHT

VERSATILE RESILIENT SAFE



Skid Box

Masonite Truck

Box Truck

Folding Box

Lewis Containers are built in numerous sizes and styles. There is no need to settle for anything less than a perfect "fit" for your handling requirements. Why not write for the Lewis catalog or call your Lewis representative.

Lewis

G. B. LEWIS COMPANY • 605 Montgomery St., Watertown, Wis.

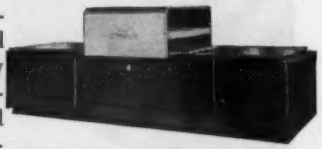
NEW EQUIPMENT SECTION

Lift Table Is Air Operated

The Sage Liftable, manufactured by Sage Equipment Company, Inc. is an air-operated unit, requiring approximately 100 pounds of air pressure. It is manufactured in 5 and 10 foot lengths, in widths up to 48 inches, and in capacities ranging from 1000 to 10,000 pounds. When the Liftable is in a raised position, the load cannot move; when it is lowered the load can move in any direction. Models are available with ball transfer base or roller base.

Circle 293 on Reader Service Card

Redesigned Skin Packaging Machine



Improved packaging efficiency and greater accessibility have been incorporated in the new model of skin packaging machines manufactured by the Skin Pack, Inc. Division of Abbott Plastic Machines Corp. Included in the new machine are automatic timers for controlling all

GOES OVER BIG for wheeling and dumping heavy materials

Costs Less per Year

Specify Sterling No. 119 HEAVY-DUTY CART Pneumatic-tired wheels or steel wheels

Here's a cart that's "tailor-made" for wheeling coal, scrap, chips, turnings, borings and similar heavy materials. All-steel, completely welded and reinforced. Made extra strong and rugged for heavy-duty service. Dumps easily. Rests securely in any one of the three positions shown here. Available with steel wheels or pneumatic-tired wheels . . . plain or roller bearings.

Write for Bulletin or see nearest dealer.

Some areas open for dealerships. Write . . .

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

A HALF CENTURY OF PROGRESS

Look for this Mark of STERLING Quality

Sterling WHEELBARROWS

Circle No. 148 on Reader Service Card for more information

25th Anniversary

Neiman

MANUFACTURERS SINCE 1932

QUALITY

STEEL SHELVING AND STEEL SHOP EQUIPMENT

Write for Catalog

Complete dealership information upon request

NEIMAN STEEL EQUIPMENT CO., Inc.

BALFOUR and VENANGO STS., PHILA 34, PA.

Circle No. 112 on Reader Service Card

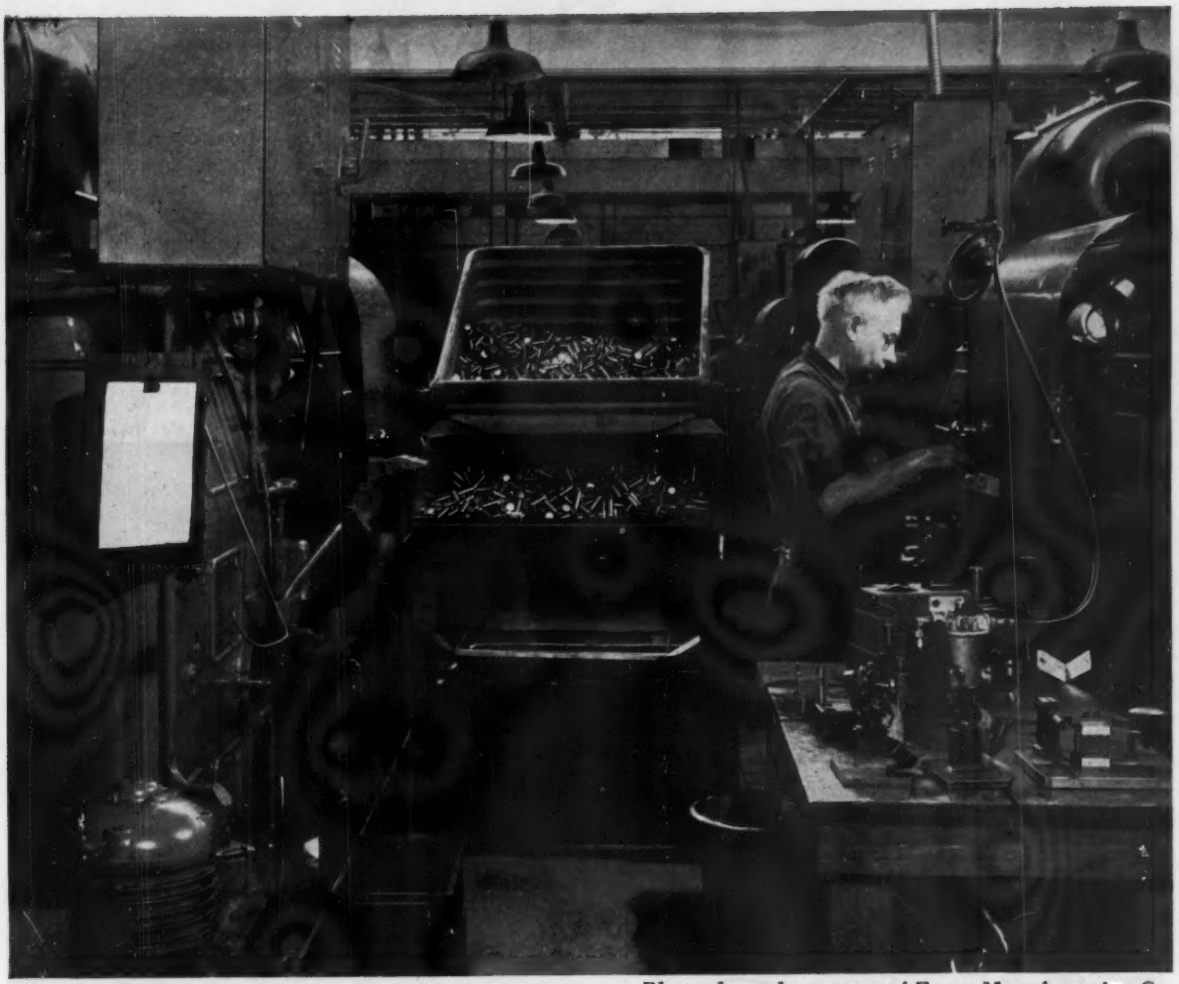


Photo through courtesy of Eaton Manufacturing Co.

MASS PRODUCTION means mass handling . . . and no other handling system can match the **Powell Flowmatic*** when it comes to smoothly and efficiently moving volume parts and materials in process. Watch it in action . . . talk with those using it and you'll understand why Flowmatic* is called the *"hottest thing in handling in a decade."* Literature upon request.

*Patent: No. 2762529

127

POWELL PRESSED STEEL SINCE 1920

POWELL *flow-mation** SYSTEMS

The Powell Pressed Steel Co. Hubbard, Ohio

Dept. 257

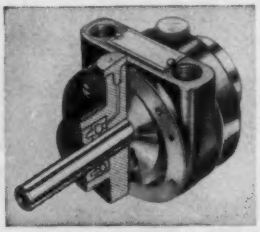
Circle 121 on Reader Service Card for more information

Circle 44 on Reader Service Card for more information

NEW! PNEUMATIC HOIST with ROTARY AIR MOTOR

Capacities 250 lbs. to 1 Ton
Fast Lifting Speeds

- Worm Geared
- Compact—Light Weight
- Exceptionally Smooth Running
- Close, Sensitive Control



PT Hoist with monorail trolley; also made with upper suspension hook.

Pulseless, rotary air motor; no pistons, no reciprocating parts.

● *Write for PT Bulletin 708*

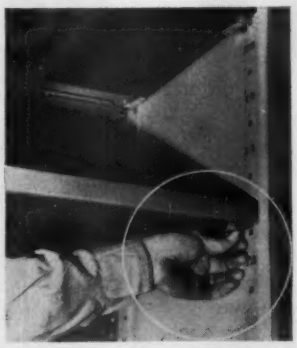
DETROIT HOIST & MACHINE CO.
8269 Morrow St., Detroit 11, Mich.

NEW EQUIPMENT SECTION

heat cycles, and primary and secondary heat, vacuum forming, over-dwell and vacuum release. The twin loading tables on each side of the oven, which permit two simultaneous packaging operations, are redesigned for greater accessibility. Loading and unloading are accomplished with a minimum of effort. The unit is available in several sizes, and can handle specially proccessed board up to 60 x 90 inches.

Circle 294 on Reader Service Card

No Tools Needed



Key to the assembly of Hallowell Erectomatic shelving is the shelf support with built-in pivoted locking device, which holds shelves solidly in place. Units can be assembled and disassembled without tools of any kind, and can be removed without tilting, making it unnecessary to remove the load or disturb the load on adjoining shelves when a shelf is repositioned. Bin fronts and partial dividers are an

NEW Bulletin Describes

NEW Demountable Wheel with 2 to 35 times longer life

Severe tests of the new Rapistan 10" MB demountable rubber wheel show it outlasts molded-on rubber wheels by 2 to 35 times to slash replacement costs. Exclusive design gives 100% easier rollability. Tires replaceable in 5 minutes. Now available in 2" and soon available in 3" tire sizes. Write for new Bulletin No. MB-57.

Rapistan
fastest growing name in casters

The RAPIDS-STANDARD CO. INCORPORATED
24 Rapistan Building
Grand Rapids 2, Mich.

TIRE REPLACED IN 5 MINUTES

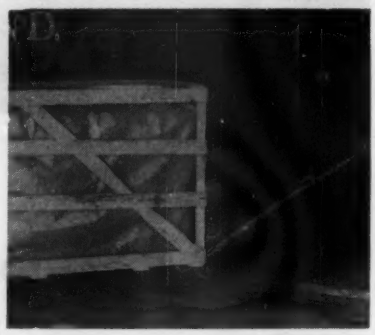
Loosen bolts

Remove tire rims

Bounce tire to loosen from rims

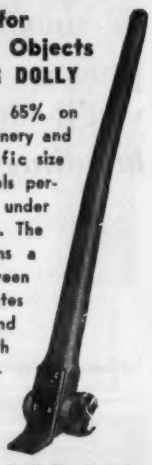
Place rims inside new tire

Replace hub assembly



A Low-Cost Tool for Moving Heavy Objects
THE MICRO LEVER DOLLY

Cuts moving time up to 65% on large cases, crates, machinery and bulky items. The scientific size and position of the wheels permit the lift blade to pry under objects flat to the floor. The wheel position also gains a high leverage ratio between power and load. Eliminates the danger of tip-ups and high falls. Four sizes, with a choice of metal or rubber wheels. See your local distributor or write:



MICRON, INC., Dept. F., Bettendorf, Ia.

Circle No. 124 on Reader Service Card for more information

Circle No. 105 on Reader Service Card

Versatility

The versatility of handling illustrated by these action shots, clearly demonstrates the flexibility of design of Youngstown containers. Our engineers can as readily tailor Youngstown containers to fit your needs perfectly.

CRANE HANDLING
FORK LIFT TRUCK HANDLING
MAGNET HANDLING

● *Consult with us for improved handling of your bulk materials*

THE YOUNGSTOWN STEEL DOOR CO.

Camel Sales Company • Camel Company Limited

CLEVELAND • CHICAGO • • NEW YORK • YOUNGSTOWN

Circle No. 174 on Reader Service Card for more information

Circle 67 on Reader Service Card for more information

Examples of a few typical circuit plans.

HERE'S HELP!

Patented SEALED-PIN CHAIN DESIGN keeps abrasives out—quadruples chain life.

Hapman TUBULAR CONVEYORS

Move almost any flowable material—wet or dry—through any plane or angle . . .

Make *big savings!* Move bulk materials *automatically*—up, down, through walls, around corners and obstacles with a Hapman! Circuits like these or complex layouts engineered to *your* needs. Usually a *single* drive unit serves where other conveyors need several. Design cuts costs. Dust and liquid *tight!*

WRITE for Circuit Bulletin and Catalog F-57

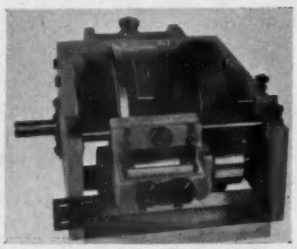
Hapman CONVEYORS, INC.
DIVISION HAPMAN-DUTTON COMPANY
KALAMAZOO MICHIGAN
In British Commonwealth & Europe: Fisher and Ludlow Ltd., Birmingham

NEW EQUIPMENT SECTION

integral part of each shelf, and need not be removed when a shelf is relocated. Hallowell Erectomatic shelving is manufactured by Standard Pressed Steel Co.

Circle 295 on Reader Service Card

Roll Printer for Polyethylene



A roll printer especially adaptable to mark-company name, trade mark, code numbers, etc., on polyethylene, vinyl and other types of plastic pipe has been developed by the Mark-em Machine Company. Called the Model 15AE, it is mounted on the extruding equipment, permitting the pipe to be marked before being coiled. Power to rotate the die wheel may be taken either from the coiling equipment or from a separate motor. Tension springs hold the printing element on the die wheel for quick changeovers. Specifications and features of the roll printer include a maximum imprint area of 24" x 1¾", with imprint repetition every 24 inches or less. Overall machine dimensions are 12½" x 18¾" x 7¾".

Circle 296 on Reader Service Card

Increase Storage Capacity with a C-F Lifter

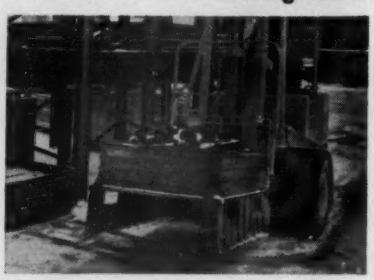
Here's 1 man—a C-F Lifter and an electric hoist handling 5 ton packs of sheet steel with speed, safety and economy. One C-F Lifter handles a wide range of sizes . . . adjustments are made by the operator in a few seconds, permitting the Lifter to shift from wide to narrow sizes in a few seconds. Made in capacities from 2 to 60 tons.

Bulletin SL-28 shows you how to cut handling costs. Write for it today.

CULLEN-FRIESTEDT CO.
1307 South Kilbourn Avenue • Chicago 23, Illinois

Circle No. 39 on Reader Service Card for more information

B.F.Goodrich
TWTAF TIRE AND WHEEL
TW ANALYSIS
cuts materials handling costs



write today—it's FREE!

SAVE up to 50% on industrial tire costs, up to 20% on maintenance costs, with a FREE B.F.Goodrich Tire and Wheel Analysis of your materials handling operations. Your B.F.Goodrich man knows which tire is right for your work. Without cost or obligation he'll study your equipment, loads, hauling surfaces and any special problems you may have. Save money! Write today for your FREE TW Analysis to *Dept. TW-639, B.F.Goodrich Tire Company, A Division of The B.F.Goodrich Company, Akron 18, Ohio.*

Specify B.F.Goodrich tires when ordering new equipment

B.F.Goodrich

Circle No. 62 on Reader Service Card

'Moving around with Mr. Stacatruc'

"Pressing ahead, John?"

"It certainly is; the Stacatruc plan is paying off."

"Where is it most noticeable?"

"In the Costs Office, I should say. With increased production and lower handling costs we're effecting a very real economy."

"Good—that's what every Stacatruc user says."

We are represented in Argentina, Australia, Belgium, Brazil, British East & West Africa, Canada, Denmark, Egypt, France, Holland, India, Ireland, Italy, New Zealand, Norway, Pakistan, Spain, Sweden, Switzerland, South Africa, Uruguay, and in all other major countries throughout the world. Full details available on request.

STACATRUC
FORK LIFT TRUCKS

BRITAIN'S BEST MOBILE MATERIALS HANDLING SYSTEM

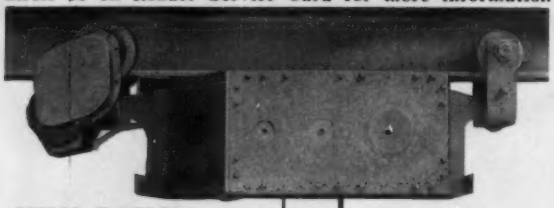
ITD LTD 95-99 LADBROKE GROVE LONDON W11 Telephone: Park 8070 (7 lines)
Grams & Cables: Indusdev Nottarch London

IN ASSOCIATION WITH AUSTIN CROMPTON PARKINSON ELECTRIC VEHICLES LTD

P4734

Circle No. 74 on Reader Service Card for more information

Circle 85 on Reader Service Card for more information



NEW DESIGN
LOW HEADROOM
HOISTS

Fraction-of-an-inch control of capacity loads from 3 to 25 tons.

New light-weight, low-headroom design solves many installation problems – in 3 to 7½ ton capacities; distance between track and eye of hook measures only 21 inches!

INCHING CONTROL – A combination of instantaneous motor torque and dual braking system provides inching control of capacity loads within thousandths-of-an-inch. Plain, hand-geared or motorized trolleys available.

DUAL BRAKING – Regenerative braking built into LeTourneau electric motors automatically regulates load travel . . . has no wearing parts, needs no adjustment. Powerful electro-mechanical brakes stop and hold capacity loads, prevent overtravel.

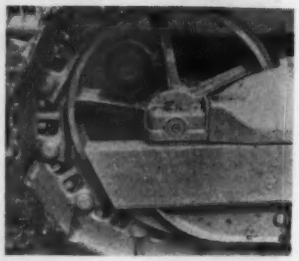
If you need to move big loads in closely defined limits, write for full information on LeTourneau "Big Lift" Hoists.

R.G. LeTOURNEAU INC
INDUSTRIAL EQUIPMENT DIVISION
2635 South MacArthur • Longview, Texas

F-119

NEW EQUIPMENT SECTION

Records Accurate Job Data



A new accessory designed to aid the owner in recording accurate job data has been announced by Caterpillar Tractor Co. The new type odometer, which records the distances traveled by Caterpillar track-type Tractors, is easily mounted on both spoke-type and disc-type idlers, to register positive mileage in both forward and reverse gears. According to the manufacturer, the unit provides 98 percent accuracy in the lower three gear ranges, and 90 percent accuracy in fourth gear. It is inoperative in fifth gear.

Circle 297 on Reader Service Card

Computer Simplifies Freight Rates

A simple computer which resembles a slide rule has just been developed to take the mystery out of one of industry's most perplexing phases—motor freight rates. The device, called the Speed-O-Rate Computer, is distributed by Speed-O-Rate Computer Sales Co. It shows at a glance the cost of shipping freight to a given destination. It consists of a semi-permanent holder with apertures on each side, and an insert card

THE EASIEST WAY TO BRIDGE A GAP

Is with a Light Weight

PENCO MAGNESIUM RAMP

ONE MAN OPERATION
LONG-LIFE
LOW COST

ONLY PENCO GIVES YOU ALL OF THESE OUTSTANDING FEATURES

1. Slanting safety "side-rails" protect ramp, equipment, tires and workers — prevents run-offs. 2. Safety "curb ends" give double strength at shock points. Permit equipment to make easy, sharp-angle turns in limited space. 3. Built like a bridge — all welded construction of lightweight magnesium diamond plate — prevents slipping. 4. Scientifically engineered — crowned construction to keep edges flush at different levels. 5. Beveled edges eliminate jars and jolts — protect loads and workers — save tires and equipment. 6. Penco exclusive — full-range, positive Locking Device — holds ramp in rigid, secure position.

PENCO ENGINEERING CO.
25 California Street, San Francisco 11

Circle No. 119 on Reader Service Card for more information

GO with a glide

on the lightest-weight steel conveyor available—the sturdy American LOAD-VEYOR. This portable conveyor has exclusive zig zag grids that support both sides of each ball-bearing wheel. Narrow packages ride smoothly between the side rails, or the conveyor sections can be inverted to handle overhanging loads.

LOAD-VEYOR, industry's Magic Carpet, is the most versatile, durable, and economical sectionalized conveyor you can buy. See it at your local distributor.

A product of

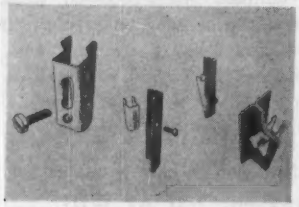
The American Pulley Company
MATERIALS-HANDLING DIVISION
4290 Wissahickon Ave. • Phila. 29, Pa.

Circle No. 9 on Reader Service Card

on which are printed the base numbers for freight rates between various cities and the actual rates for various freight classifications. The minimum charge per shipment, as well as any surcharges, is also noted.

Circle 298 on Reader Service Card

Clips and Studs Hold Shelving



Only a screwdriver and a few seconds are needed to install or shift its new Clip-Type Convertable Shelving, according to Republic Steel Corporation's Berger Division. Instead of fastening to uprights with conventional nuts and bolts, the shelving is supported by special clips and studs. A keyhole slot in the clip slips over the threads of the screw-type stud. It is locked securely to the upright with a quarter turn of the stud. The lower extrusion of the clip fits into a hole in the upright to prevent rotation of the clip and add to its weight-carrying capacity. Each shelf is supported by four clips. Clips and studs are finished in cadmium for resistance to rust.

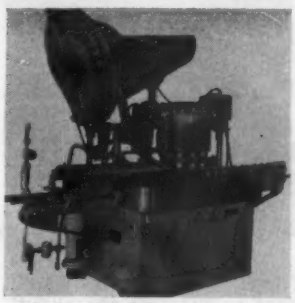
Circle 299 on Reader Service Card

New Concept in Automotive Braking

Automatic Brake Corporation has introduced a new device which, when installed in new or used vehicles, activates the brake system when the driver removes his foot from the accelerator. Thus braking is accomplished without use of the brake pedal. Called the Autotrol, the device applies smooth, even pressure to the hydraulic brake system, in exactly the right amount to bring the vehicle to a quick, safe stop the instant pressure is relaxed from the accelerator. According to the manufacturer, Autotrol provides quicker and safer stops than conventional brake systems, without the forward pitching of sudden stops. The brake pedal remains operable, but need rarely be used. Another advantage of the system is that it provides automatic hill holding.

Circle 300 on Reader Service Card

Controlled Vacuum Capper



The Ball Brothers Company has introduced a new capping machine featuring a controlled vacuum system, a new glass finish, and a non-toxic gasket of a new formulation. With the controlled vacuum system, both the caps and glass are pre-positioned. After positioning, the cap is titled and the head space of the jar is flushed with a controlled steam jet. The

BAUGHMAN BULK MATERIAL TRANSPORT BODY . . .

designed for

Cement, Salt, Sand, or any free flowing material

FOR ADDITIONAL INFORMATION

write for new illustrated bulk body catalog.

- **NEW 9" NON-CLOGGING AUGER.** Located at bottom of body. Unloads 1 to 2 tons per minute, depending on material.
- **COMPARTMENTED BODY.** Relieves weight of full load on conveyor. Compartment doors individually tripped as load empties.
- **SCIENTIFICALLY SLOPED SIDES.** Assure constant material feed to auger. For any dry, free-flowing, non-abrasive material.

Dealers wanted in Selected Areas

BAUGHMAN

BAUGHMAN MANUFACTURING COMPANY

106 ARCH STREET • JERSEYVILLE, ILL.

Circle No. 19 on Reader Service Card for more information

Circle 156 on Reader Service Card for more information

Stop dangerous handling of INDUSTRIAL LIQUIDS

You can stop dangerous handling of liquids with Tokheim high vacuum pumps. Their use in maintenance work will help prevent spilling, slopping, over-filling and dripping—all enemies of safety. This means your plant can be kept cleaner—work is speeded—waste halted—accidents prevented.

Tokheims are available with hose or spout outlets and other optional attachments. Pump operates on both forward and back strokes—delivers 20 gallons a minute. Will pump 'most anything that pours. Offered with alternate parts to handle special liquids.

TOKHEIM DOUBLE-ACTION HAND PUMPS

Call your dealer, your Tokheim representative; write factory for literature —and approved liquid list.

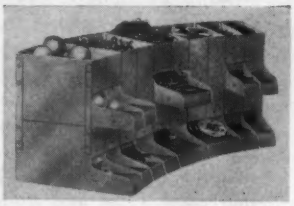
General Products Division
TOKHEIM CORPORATION
DESIGNERS AND BUILDERS OF SUPERIOR EQUIPMENT
1661 Wabash Avenue SINCE 1901 Fort Wayne 1, Indiana
Subsidiaries: Tokheim N.V., Leiden, Holland—GenPro, Inc., Shelbyville, Ind.
Factory Branch: 475 Ninth Street, San Francisco 3, California
In Canada: Tokheim-Reeder of Canada, Ltd., 205 Yonge St., Toronto, Ont.

NEW EQUIPMENT SECTION

jar is immediately sealed. Using only five to eight pounds of steam pressure, this method is said to result in consultant, uniform vacuum levels. The familiar knurled skirts, coupled with recessed external lugs, provides the new cap with a positive gripping surface which allows for ease in opening and resealing. No foodstuffs can be caught or retained on the inside of the cap.

Circle 301 on Reader Service Card

Assembled, Dis-Assembled At Will



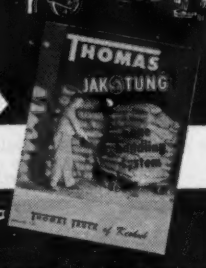
A new do-it-yourself small parts bin, completely adaptable to any installation, is offered by Speed Assembly Equipment Co. Called the Speedbin, it is made of 12 standard heavy gauge steel parts which can be arranged in a number of varied designs, to suit changing needs. Each bin can be assembled and disassembled quickly and easily, to be stored flat when not in use, and can be adjusted in width from 2½ to 15 inches. A typical installation of six bins forms an arc with a 19-inch radius in front of the operator.

Circle 302 on Reader Service Card

THOMAS JAK TUNG SYSTEM

"JOB-SUITED" to TRUCK, STORE and SPOT your loads WITHOUT REHANDLING

WRITE FOR CATALOG NO. JT-53

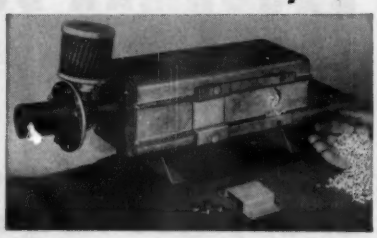


THOMAS TRUCK & CASTER CO.
722 Mississippi River • Keokuk, Iowa

THOMAS MAKES ALL KINDS OF TRUCKS, SKIDS, CASTERS AND WHEELS

Circle No. 154 on Reader Service Card for more information

For Special Fume Problems . . .



A CATALYTIC EXHAUST PURIFIER THAT WORKS WITH LEADED GASOLINE

When leaded gasoline* is used in fork lift trucks and other equipment, dangerous carbon monoxide, hydrocarbons, exhaust fumes and odors can now be safely controlled with the new Oxy-Muffler, another member of the famous Oxy-Catalyst family of catalytic exhaust purifiers.

The Oxy-Muffler will give hundreds of hours of trouble-free service. If you have a fume problem with leaded gasoline, write for details on the new Oxy-Muffler now.

*Where nonleaded gasoline or LP-gas can be used, the OCM Catalytic Exhaust Purifier is recommended.

OXY-CATALYST, INC.
Wayne 1, Pa., U.S.A.
Catalysts for fume and odor elimination, air pollution control, and waste heat recovery

Circle No. 116 on Reader Service Card

Portable Elevator Is Completely Redesigned

The American Pulley Company has introduced its completely new and redesigned line of Safeway portable elevating trucks. These units include fork and platform trucks, drum stackers and straddle models. Maximum loads range from 1000 pounds for the pedal-operated models, to 1500 pounds for battery-powered trucks. Standard models lift as high as 96 inches. Attachments such as forks, rams, platforms and drum stackers are completely interchangeable by the user.

Circle 303 on Reader Service Card

Unloads from Individual Buckets

A new side-dump transport, manufactured by Baughman Mfg. Co., unloads from individual buckets into truck mounted spreader bodies, portable concrete mixers, etc. The buckets can be raised or lowered by means of hydraulic rams, which are mounted on a monorail and moved into unloading position by means of a winch arrangement. Buckets are available with or without lids, and lids fold out during discharge to form discharge chutes. Controls are conveniently located on the side of the body, and operate either a P.T.O. or auxiliary engine drive for the hydraulic system. Dumping height is approximately 103 inches, with a per bucket capacity up to six tons, depending on material. Models with up to six buckets are available.

Circle 304 on Reader Service Card

Marking Ink In Aerosol Can

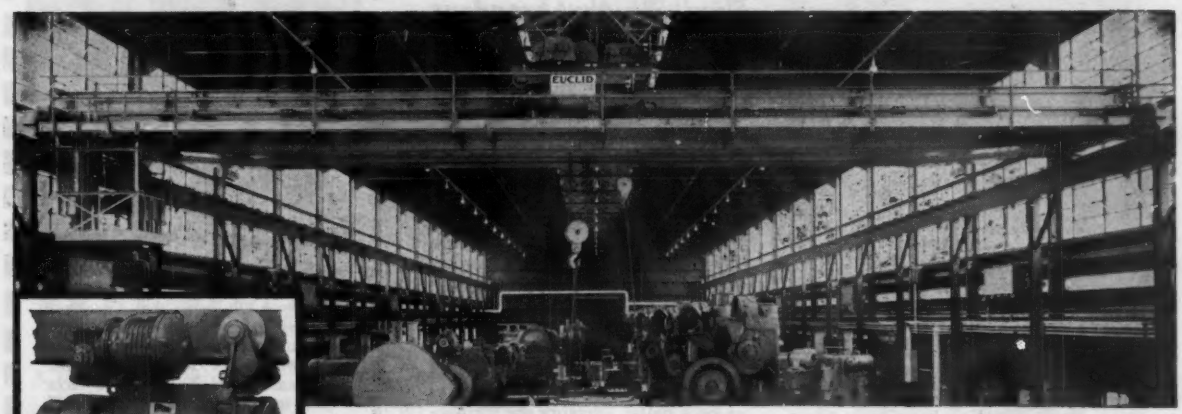
A quick drying weather proof ink spray adaptable for aerosol use has been produced by the Illinois Bronze Powder Co. Available in eight colors, including a kraft colored opaque that covers old markings, this spray ink is said to provide a faster, easier way of inking stencils, marking packages, and coding equipment. Suitable for use on both porous and non-porous surfaces, it eliminates messiness.

Circle 305 on Reader Service Card

that "NEEDED LIFT" can come from EUCLID CRANES & HOISTS TO "RAISE PROFITS"

You name the job or jobs to be done! We'll supply a crane or cranes that will do it. Standard Models in a wide range of styles, sizes and capacities will generally meet your requirements. If not, we'll engineer and build what you need. We've been doing it for more than 40 years.

GET A EUCLID PROPOSAL



In Capacities from 2000 to 50,000 lbs. EUCLID SERIES H HOISTS

EUCLID HOISTS are highly efficient and strictly modern in every detail with oversize anti-friction bearings and heat treated steel parts in combination with a welded frame.

The planetary gearing and mechanical load brake are mounted in oil tight housings. The hoist gearing is assembled in the hoist drum.

This design produces an unusual compact, rugged and accessible hoist readily adapted to various installations and types of control.

for Details & Catalog, write THE EUCLID CRANE & HOIST COMPANY 1362 CHARDON ROAD • CLEVELAND 17, OHIO

Circle No. 54 on Reader Service Card for more information

Circle 81 on Reader Service Card for more information

IRONBOUND SKIDS

Full range of sizes, types, capacities, underclearances!

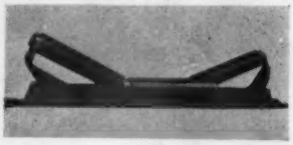
Bolted and welded construction of C-type skids feature easy deckboard replacement.

Ironbound — IRONBOUND

30 Hoffman Place • Hillside, N. J.

NEW EQUIPMENT SECTION

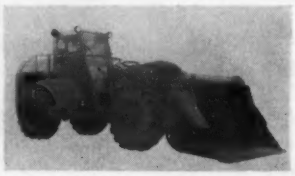
Cuts Maintenance and Replacement



Maintenance and replacement of belt conveyor rolls and return idlers can be reduced with a new conveyor roller introduced by Bearings, Inc. The rolls employ a removable ball bearing stud assembly. Since the bearings are mounted in the removable studs, it is not necessary to replace rolls due to worn or damaged studs. All rolls are machined to exact internal clearance, and bearings are accurately mounted in line with two running rolls. Rolls equipped with the removable studs are carried in stock in diameters from 2⅜ to 4 inches, in lengths from 12 to over 36 inches.

Circle 306 on Reader Service Card

Has 35,000 Pound Capacity



A six cubic yard Scoopmobile, a front end loader with a break-out capacity of 35,000 pounds and a working capacity of 25,000 pounds, has been introduced by Mixermobile Manufacturers. The

Two versatile, power-propelled Walkie-Worklifters handle a variety of transporting and stacking chores at the Minneapolis-Honeywell Regulator Co. plant in Morton Grove, Illinois.

Walkie Worklifter

Flexibility that broadens material handling possibilities...

Industry has found that the versatile Walkie-Worklifter enables it to better utilize existing space, save handling costs and manpower, and speed up efficiency on a multitude of varied duties.

Compact Walkie-Worklifters are ideally qualified for trouble-shooting, wide-range service because of their ruggedness, light weight, narrow frames and maneuverability.

For example, even in narrow aisles Walkies are kept busy stacking unit loads, hand-stock-picking small orders (where the operator rides up on a pallet, carrying the lift control), promptly storing parts and finished products, loading and unloading trucks, etc. To learn how Walkie-Worklifters can fulfill *your* needs, write for more information.

Capacities from 1000 to 2000 lbs. Lifting heights from 58 to 120". Narrow frames or straddle bases. Prices from $1250.

TYPICAL USER EXPERIENCES

"... have cut out manpower necessary to unload semi-trailers of fertilizer and salt from four men to one man in the same number of hours." E. M. Soukup, Soukup Hardware Stores, Wheaton, Ill.

"... actually works out better for us than a much more expensive piece of equipment... more maneuverable." J. B. Straus, V.P., Straus-Bodenheimer Co., Houston.

"... is in almost constant operation ... one of the handiest pieces of equipment for a warehouse that I have ever seen." H. C. Robinson, Pres., Johnson & Company Cable Cord, Inc., New York.

ECONOMY ENGINEERING 4524 W. Lake St., Chicago 24, Ill.

Circle No. 50 on Reader Service Card for more information

"Red Head" PULLEYS

Any Size—Any Shape

Don't say conveyor pulley—*SAY* Red Head Seamless Solid Steel Conveyor Pulleys—the Conveyor Pulleys with no seams on the surface—guaranteed longer belt life—for you with quick delivery. Available in diameters of 2" to 36", in faces of 6" to 168" and each "Red Head" represents years of meeting the most exacting demands of all types of Conveyors. Both Crown and Straight faces available. Write or call us for immediate attention.

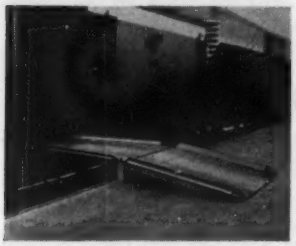
MERCURY INDUSTRIES, INC.
(PULLEY & ROLL DIVISION—DEPT. FR-11)
HILLSDALE, NEW JERSEY
TEL. WESTWOOD 5-2616

Circle 101 on Reader Service Card

Model LD20AD Scoopmobile features 4-wheel steering, 2-axle oscillation, and 100 percent break-out action. The full chassis width cab is said to offer complete operator safety and excellent visibility. The unit is equipped with torque converter, power-shift full reversing transmission, power steering, 4-wheel planetary drive, and roll-out high discharge bucket with variable discharge height.

Circle 307 on Reader Service Card

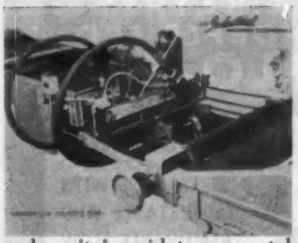
Combination Ramp—Dockboard



Lite-Line Industries Division of Copperloy Corporation has announced a new all magnesium combination ramp-dockboard. The unit is designed for use where a long approach is needed to compensate for large height differentials between the dock and the carrier floor. It can also be applied to situations where low underclearance problems require a long, gentle slope. It is built in two detachable sections, which are firmly locked together and held in place by a positive positioning device. Designated the Model RD, the unit is available for both truck and freight car loading, and can also be used for refrigerator car loading.

Circle 308 on Reader Service Card

Spot-Prints on Bags



The industrial Marking Equipment Co. has developed the #S-90 automatic marking unit which can be adapted for use with most bag making machines. Synchronized with and taking speed from the bag maker, it is said to accurately spot-print in all combinations of colors, letters, or numbers on polyethylene, pliofilm, waxed paper, foil, tissue and similar materials that take hot roll leaf impressions. Operating without an attendant, the #S-90 gives impressions which won't crack, chip, smear or rub off. Brass or steel type lasts almost indefinitely and is easily changed to suit specific product or batch needs.

Circle 309 on Reader Service Card

Combines Convenience with Safety

The Model MC Electric Safety Control for commercial garage and industrial doors combines convenience with safety. One touch of the "open" button of the control station opens the door completely, freeing the worker or attendant while the vehicle enters or exits. But continuous pressure is required on the "close" button until the door is completely closed. In this way, supervision of the doorway is guaranteed while the door is closing. If the "close" button is

Europe's Leading Makers of

FORK LIFT TRUCK

Attachments

A really comprehensive series of attachments used in most industries is available, together with an unrivalled design service. Write now for details of these and other Handling Aids.

HYDRUM

MECHANICAL HANDLING APPLIANCES, INCLUDING PATENT "ON-THE-ROLL" RACKING.

R. H. CORBETT & COMPANY LIMITED

Proprietors:— Woodfield Hoist & Associated Industries Ltd.

HYDRUM WORKS · BURGESS HILL · SUSSEX

Circle No. 188 on Reader Service Card for more information

Circle 180 on Reader Service Card for more information

NEW BATHEY HOPPER FRONT FLO-BINS

For SMALL PARTS ASSEMBLY

3 SIZES . . . WITH ADJUSTABLE AND REMOVABLE FLOW CONTROL BAFFLE.

MBC NATIONALLY ADVERTISED

NEW CURVED FRAME FOR BENCH OR CONVEYOR ASSEMBLY

B-15 DEALERS IN PRINCIPAL CITIES

BATHEY MFG. CO.

100 S. MILL STREET PLYMOUTH, MICH.

NEW EQUIPMENT SECTION

released at any time before the closing cycle is completed, the door automatically reverses. The control is manufactured by the Barber-Colman Company.

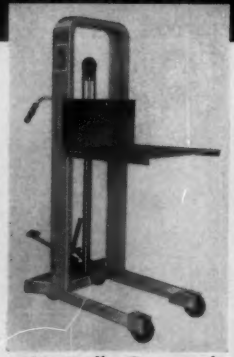
Circle 310 on Reader Service Card

Sweeper Has New Styling

"Automotive industry styling" has been designed into the new Wilshire Model 1500 industrial power sweeper introduced recently by the Wilshire Power Sweeper Co. Power economy allows a full 8-hour day of sweeping on one tank of gas. The unit has a 3-speed transmission. Its new dust system incorporates the use of a high volume fan which deposits all dust into a heavy duty bag that can be cleaned without removal from the machine. The 7-inch lift of its sweeping chamber enables it to sweep bulky debris. The unit is said to be capable of sweeping 126,000 square feet per hour, sweeping at 6 mph in open areas. It is equipped to sweep at 10 mph.

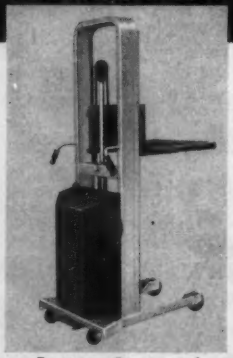
Circle 311 on Reader Service Card

PRESTO-Pacer HYDRAULIC LIFT



Manually Operated
1000 LB. CAPACITY
$195 F.O.B. Factory
Deliveries From Stock
• Lifting Height 52" • Platform 24"x24"

PRESTO-Pacemaker HYDRAULIC LIFT



Battery Operated
1000 LB. CAPACITY
$395 F.O.B. Factory
Delivered Complete
Ready for Immediate Use
• Lifting Height 52" • 24"x24" Platform

QUALITY is our most important product

LEE Engineering Company
269 ARMISTICE BOULEVARD, PAWTUCKET, RHODE ISLAND

Circle No. 90 on Reader Service Card for more information

ARMSTRONG-BRAY STEELGRIP FLEXIBLE BELT LACING

for joining BELTS —from narrow power belts up to 8 ft.

WIDE CONVEYOR BELTS

STEELGRIP Flexible Belt Lacing makes strong, smooth-running, flexible joints in either power drive or conveyor belts. Applied anywhere, with a hammer, it penetrates the toughest belting easily, clinches securely, compressing belt ends and preventing fraying. Double rocker pins increase flexibility and take up wear.

Packaged in convenient boxes for power transmission belts, STEELGRIP also comes in long lengths (to 8 ft.) for wide conveyor belts, and in monel metal for wet or corrosion situations. Eleven sizes for all belting from 1/16" to 5/8" thickness.

Write for catalog showing most complete line of belt lacing, belt hooks, belt plates, etc.

ARMSTRONG-BRAY & COMPANY
5396 Northwest Highway • Chicago 30, Ill.

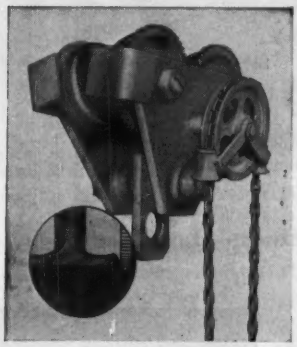
Circle 12 on Reader Service Card

For Blister or Skin-Pack Operations

The Auto-Vac Co. has announced its new Skin-Pak machine, The unit is designed for complete versatility in either packaging operations or low profile (up to 7 inches) drape forming applications, such as food containers, toys, novelties, displays, etc. Rolls of cellulose acetate, butyrate, vinyl, polyethylene and polystyrene up to 22 inches wide and .030 inch thick can be used. The machine is equipped with a device for pulling the formed plastic away from the molded area, and simultaneously cutting the previously formed section from the roll.

Circle 312 on Reader Service Card

No Lubrication Needed



Two new lines of I-beam trolleys with capacities from 3 through 10 tons have been introduced by Shaw Box Crane & Hoist Division of Manning, Maxwell & Moore, Inc. Both lines eliminate the need for lubrication by featuring life-lubricated bearings throughout. Flame-hardened forges steel alloy wheels are said to keep tread wear at a minimum, and crowned treads provide easy rolling characteristics. Crowning also allows the trolleys to operate equally well on all I-beam flange tapers from 0° through 15°. Called the Budgit "Hi-Cap" trolleys, one line is push-type while the other is hand geared (shown). All capacities are easily adaptable to a wide range of I-beam sizes by rearrangement of the spacer washers on the cross shaft.

Circle 313 on Reader Service Card

Has No Hinges

A hingeless metal troughing conveyor has been perfected by R. T. Sheehan Company. The unit is available for material handling applications involving the conveying of liquids, chips, scraps, stampings, grains, powders, etc. Materials are conveyed in bucket-like pans that are attached to the driving mechanism in such a way that they are not hinged to each other. The buckets may be made of any material to suit individual requirements, including stainless steel for conveying foods or corrosive materials. Length, width, depth and height may also be adapted to suit the application, with a minimum height of 14 inches from the floor. Units may be portable or stationary.

Circle 314 on Reader Service Card

PRODUCTS
ROLL FASTER
and more
Economically
on LANCO
TRAIN
TRAILERS
DOUBLE
BALL-BEARING
CASTERS
• HIGH SPEED
• HEAVY DUTY
• LONG LIFE
Lanco Train Trailers' high speed maneuverability is the combined result of superior design and quality construction. Double ball-bearing steering casters and heavy duty 3 inch structural "T" iron frames give added strength for long, heavy duty use. Models for tractors, overhead or in-floor conveyors, rider or remote control.
A complete selection of material handling equipment, including hand and platform trucks, is available. Write for catalog.
LANSING
SINCE 1881
LANSING CO.
LANCO MATERIAL HANDLING EQUIPMENT
LANSING, MICHIGAN
75
"Specify Lanco and Be Sure"

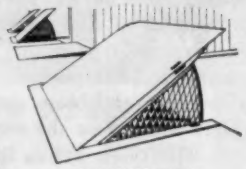
Circle No. 89 on Reader Service Card for more information

Circle 20 on Reader Service Card for more information

Circle 94 on Reader Service Card for more information

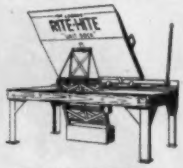
LOADING DOCK PROBLEMS?

3 easy ways to solve them —and most economically, too!



RECESSED RAMPS
Two standard, 60" x 60" and 72" x 72". Two flush-type, 72" x 72" and 96" x 72".

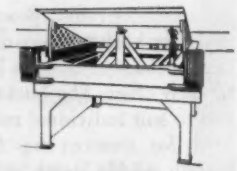
RITE • HITE
mechanical
loading ramps



SELF-CONTAINED RAMP
For non-permanent installations. 72" x 72".

10-ton capacity

Practically no maintenance! Rite-Hite *precision counterbalanced* design eliminates troublesome cylinders, pumps, motors, starters, piping, valves, wiring, gears, cables. Rite-Hites are not affected by dirt, debris, extreme heat or cold. Easy to install—furnished complete, no "extras" to buy. All-welded heavy steel construction. You can be *sure*, when it's a Rite-Hite, it's right. Get full details—write Dept. F-57



TRUCK-ACTUATED RAMPS
Two models, recessed and self contained, 96" x 72".

RITE-HITE DIVISION

LOOMIS MACHINE COMPANY
133 EAST FOURTH STREET, CLARE, MICHIGAN

MERRILL MATERIAL HANDLING EQUIPMENT

Sold by Better Distributors Everywhere

MERRILL BROTHERS

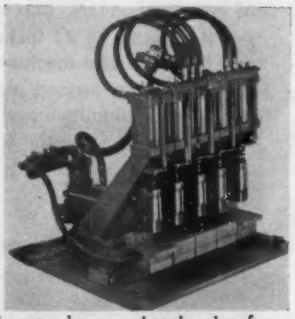
For Interesting Information write

56-74 ARNOLD AVE., MASPETH, N. Y.

Circle 103 on Reader Service Card for more information

NEW EQUIPMENT SECTION

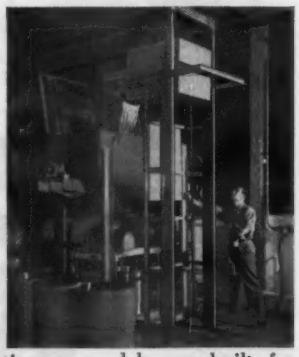
Stapler with Varying Head Arrangements



Any desired formation of heads is available in the new Duo-Fast Bench Model stapler, recently introduced by Fastener Corporation. The air-operated all-purpose unit is available in single or multiple unit models, assembled in any desired formation including a circle. Six different heads are available for staples ranging in size from 5/32 to 9/16 inch. The units operate on 40 to 110 pounds air pressure, which can be regulated to provide the desired stapling power.

Circle 315 on Reader Service Card

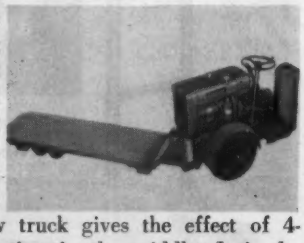
Lifts, Upends, Dumps Loads to 4000 Pounds



Drums, barrels, boxes, and bags can be handled easily with a mechanical lifter-dumper now being manufactured by Essex Conveyors, Inc. Seventy-five, 400 pound loads can be handled per hour with the CESCO Jr. The standard dumper models are made in various sizes to dump at any height ranging from 2 to 8 feet. Stationary models are built for dumping at any height. Standard push button controls and a ¼ h.p. motor are features.

Circle 316 on Reader Service Card

Articulated Platform Truck



An articulated joint between the drive unit and the platform that completely eliminated conventional steering parts is the heart of a truck manufactured by Erickson Power Lift Trucks, Inc. This new truck gives the effect of 4-wheel steering by pivoting in the middle. It is designed for horizontal handling such as heavy unit loads of building materials, and warehouse stocks on skids. Turning radius depends on the size of the platform beds which are offered up to 10 or 12 feet long, or longer. The platform rises vertically without swing-

Circle 45 on Reader Service Card for more information

ing up or tilting back. Model P-7A has a capacity of 7000 pounds, larger models are available up to 15,000 pounds.

Circle 317 on Reader Service Card

Pneumatic Tire Trucks for Outside Handling

The Industrial Truck Division, Clark Equipment Company, has introduced two models of a high-capacity, pneumatic tire fork truck designed for difficult

outside handling. The CFY-180 has 18,000 pounds capacity and the CFY-165 has 16,500 pounds capacity. Both have dual drive wheels, and power steering and power brakes are standard. The drive axle design, with final reduction directly at each drive wheel, provides for traction through mud, snow and sand. The trucks are 169 inches long and 96 inches wide.

Circle 318 on Reader Service Card

Circle 20 on Reader Service Card for more information

BELT VERSA-VEYOR

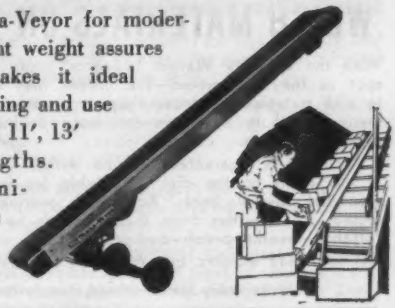
THE VERSATILE COMPLETE LINE OF CONVEYORS

SERIES R

Heavy-duty Versa-Veyor speeds up handling, slows down costs. Tops for moving bags and boxes. Moves easily from one job to the next. 13′ to 19′ lengths with undercarriage.

SERIES S12A

Low-cost Versa-Veyor for moderate loads. Light weight assures portability, makes it ideal for truck loading and use over stairways. 11′, 13′ and 15′ lengths. Strong, aluminum box-type frame.



THE BELT CORPORATION

5711 Stahl Rd. Orient, Ohio

with PALITON work easy
HYDRAULIC LIFT TRUCKS
Heavy Pallet Loads move faster
STANDARD CAPACITY
4,600 lbs
Three strokes lift pallet free of floor.
BRIEFLY—THE BEST IN THE WORLD USED EXCLUSIVELY IN ROLLS ROYCE PLANTS
All welded steel body—6 ton Hydraulic Ram Pump. Two Roller Bearings on all wheels front and rear. Neutral control for free handle movement.
Grease Gun lubrication throughout. Easily serviced. Weight only 250 lbs. Send for pamphlet now.
90 day guarantee every truck.
Made in U.S.A. by COLES CRANES INC. P. O. Box 942, JOLIET, ILL. and available all dealers
Made in England by OMIC LIMITED, LONDON
In Canada from ELECTRO HYDRAULICS (CANADA) LIMITED 18 Ingram Drive, Toronto 9.

Circle No. 115 on Reader Service Card for more information

Circle 184 on Reader Service Card for more information

Circle 45 on Reader Service Card for more information

WEIGH MATERIALS ON THE SPOT!

With the DILLON Weight Indicator, loads are checked on the spot as they are moved—the instant they are lifted. No need to pick materials up, move them to a scale, set them down and then pick them up again—no more double handling or high operational costs.

Accuracy is guaranteed to be within ONE division or less at any point on the dial. Adjustable for large tare loads. 16" dia. dial. Swivel hook. Accidental overload and shock protected. 6 capacities from 0-250 pounds up to 0-5,000 pounds. Portable—weather-proof—dust-proof. Each unit calibrated with certified dead weights. Extreme utility at LOW cost!

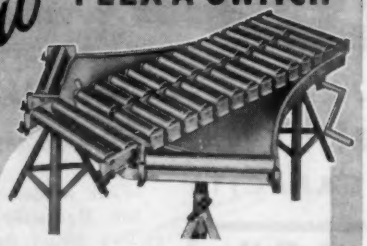
Write today for illustrated, descriptive literature.

W. C. DILLON & CO., INC.

14568Q Keswick St., Van Nuys 8, Calif. (Suburb of Los Angeles)

3 WAY Flow "FLEX-A-SWITCH"

LEFT and RIGHT and THROUGH



ROLLERS are concentric at any setting to assure positive line of travel without guard rails. Can be used with curves and straight sections to distribute work in production or warehouse handling. Standard 11½"; 15"; 18" conveyor widths.

2 WAY Flow

Remote or manual control. Remote control illustrated at left.

WRITE FOR DETAILS

• LEFT & THROUGH
• RIGHT & THROUGH

METZGAR CONVEYOR CO.

MFRS. OF WHEEL & ROLLER GRAVITY & LIVE ROLLER CONVEYORS • POWER BELT CONVEYORS • SWITCHES • ACCESSORIES

423 DOUGLAS ST., N. W. GRAND RAPIDS 4, MICH.

Circle 104 on Reader Service Card for more information

NEW EQUIPMENT SECTION

Handles Problem Materials

American Planter Company has introduced a conveyor designed to handle certain problem materials. It is said to overcome the difficulites of sand or residues built up in pulleys from seepage under the belt. The conveyor will be produced as Model 600 ZA with self cleated rubberized belt, and as Model ZM with steel mesh belt.

Circle 320 on Reader Service Card

New All-Hydraulic Fork Truck

The Pettibone Mulliken Company has introduced an all-hydraulic line of gasoline or LP-Gas operated fork trucks. These trucks, designated as "Speed-Lift", are said to have over 450 fewer parts due to

the new all-hydraulic design. Operation of the truck follows the principles of the standard automobile. The overall length of the truck is 84 inches and it will turn in its own length. The rear wheel turns a full 90 degrees in either direction. Dead man control and interchangeable pneumatic or cushion, 21 inch wheels are features. Due to the interchangeable wheels the units can be used both as yard trucks and warehouse trucks. They are said to be suited for operation in areas where floor capacities are limited.

Circle 321 on Reader Service Card

Vibratory Feeder

A new, extra small Vibratory feeder, with a feed rate of up to 500 pounds per hour of bulk material has been manufactured by the Syntron Co. This new design, Model F-10, utilizes the electromagnetic vibrating principle. Bearings, sprockets, chains, gears, belts and idlers, are eliminated. A rheostat controls the rate of material flow from the feeder. The unit is 6 inches high, 15 inches long, and weighs 10-½ pounds. The trough is 1-½ inches by 12 inches.

Circle 322 on Reader Service Card

Lightweight, Portable Ramp

A safe portable ramp made of lightweight magnesium has been introduced by the Lite-Line Metal Industries Division of Copperloy Corp. One man can move and position the ramp, and a positive locking device prevents the ramp from pulling away. Safety tread surfaces assure all weather traction and special safety curbing along the full length of the ramp prevents run-offs. Standard ramps are available in 6,000, 10,000, 12,000 and 16,000 pound capacities. Models are 30 feet long and 60 or 70 inches wide.

Circle 323 on Reader Service Card

Loads Automatically

Palmer-Shile Company has introduced a type of barrel truck for handling barrels weighing up to 1,000 pounds. Trucks are constructed of heavy tubing and other steel parts, and have two roller bearing wheels. Automatic loading is accomplished by placing the truck against the barrel or drum, and dropping the sliding steel "catch" down over the rim. The truck loads from a row as well as a barrel standing alone.

Circle 324 on Reader Service Card

LIGHT, RIGID BOXES

STACK when full, NEST when empty

Delivery, manufacturing and materials handling operations are facilitated with this series of stacking-nesting type tote boxes. They are made of Chem-Board, a rigidized heavy duty corrugated board that is strong, lightweight and durable. Boxes have bail handles of 7-gage steel rod that flip in for stacking, and flip out and down for nesting to minimize storage space. Illustrated boxes measure 19 in. wide, 25 in. long and 13 in. deep. They weigh 9½ lb. Approximately 30 other sizes are available.

CONVOY, INC. Phone GReenwood 7-4569
P. O. Station B, Box 216-F CANTON 6, OHIO

Circle 179 on Reader Service Card for more information

Circle 184 on Reader Service Card for more information

ROTATORS

move loads Faster, Easier and Safer with

Universal LIFT TRUCK ATTACHMENTS

Engineered Universal Attachments

- Roll Clamps
- Carton Clamps
- General Purpose Clamps
- Rotators
- Side Shifters
- Stabilizers
- Box Dumpers
- Crate Clamps

Whether you want rotators for box dumpers, roll or drum clamps, or any other purpose—Universal makes the rotator you need.

COMPLETE LINE INCLUDES: (1) direct cylinder drive, 90° rotator (2) cylinder chain and sprocket drive, 190° rotator (3) fluid motor drive, chain and sprocket 360° rotator.

SAVE MONEY. Rugged, all welded construction and simple design pays off in longer service life and less maintenance.

OTHER ATTACHMENTS: Universal makes the most complete line of all types of attachments to meet your specific needs. *See your Lift Truck Representative.*

Universal **CLAMP CO., ST. LOUIS 14, MO.**

Pack, Inspect and Assemble

with ISLAND UNITIZED CONVEYOR TABLES

SPEEDS UP PRODUCTION

An all-purpose portable belt conveyor, work table and straight-line production system, with and without side leaves. Available up to 100 ft. long in 10 ft. easily assembled sections.

PORTABLE OR STATIONARY

The perfect mechanized table for assembly, inspection and packaging operations. Available in steel or stainless steel with fixed or variable speed.

FREE!

ISLAND EQUIPMENT CORP. Dept. F-5
27-01 Bridge Plaza North
Long Island City 1, N. Y.

Please send Bulletin 1P-1 on Island Unitized Conveyor Tables.

NAME_____

ADDRESS_____

CITY_____ STATE_____

Circle 82 on Reader Service Card for more information

THE PALLET TRUCK

"BUY-OF-THE-YEAR"

BARRETT

MODEL HX

with the Revolutionary New *Flying Saucer* wheels!

Diagram shows how angular-mounting entry wheels climb bottom board of double-face pallet... prevent "push-away" annoyance. An exclusive Barrett feature.

Plus all these big-quality features Mac says, "Check these plus values!"

- "Unitized" hydraulic pump and ram—cuts service worries.
- Overload valve—protects truck and load against damage.
- All-welded construction—lighter, stronger.
- Spring-controlled foot treadle—out of way when not in use.
- Handle brake pad—for extra safety.
- Twin lowering treadles—one on each side for quick operation.
- Needle-type lowering valve—adjustable for perfect control.
- Shorter over-all length—easier operation in cramped spaces.
- Full 4½" lift—multiple stroke—maximum underclearance.

2000-lb. capacity. Other models in 4000- and 6000-lb. capacities. Write for Bulletin 5511.

BARRETT

ONE MAN DOES MORE THAN 3 OR 4...WITH A BARRETT

BARRETT-CRAVENS COMPANY, 614 Dundee Road, Northbrook, Illinois. Representatives in all principal cities.

Canadian licensee, S. A. Armstrong, Ltd., Toronto, Canada.

Circle 193 on Reader Service Card for more information

NEW EQUIPMENT SECTION

Stabilizes Package Temperature

Packages can be held at any temperature from 40 to 120 degrees F. by use of Transit-Heet, a new self-contained temperature stabilizer developed by Jet-Heet,

Inc. The chemical was originally developed to aid in the research of Salk polio vaccine. It is said to hold package contents at the temperature at which they are originally shipped, regardless of changes in environmental changes. It is available commercially in one-quart sealed cans, can be used indefinitely.

Circle 325 on Reader Service Card

Ametron® ELECTRONIC CRANE SCALES

Weighs heavy loads suspended from crane hook. Printer, located in crane cab or other convenient location, records weight on tape or cars. New compact printer only 22" x 18" x 10½".

Entire assembly designed for prompt and easy installation. Now available at new low cost. Capacities 5, 10, 15 tons.

Write for Free Ametron Brochure 6

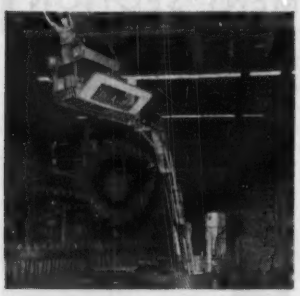
STREETER-AMET COMPANY

GRAYSLAKE, ILLINOIS

THE STANDARD OF ACCURACY SINCE 1888

Circle 149 on Reader Service Card for more information

28 Foot Five Section Mast



A new 28 foot Five Section Mast Unit, designed for fast maintenance service of overhead systems, has been developed by the Lift-A-Loft Company. The unit has a collaspsed height of 83-½ inches, and its extended height, to the floor of the platform, is 28 feet. It is designed for a one man operation, all controls for the operation of the unit are located conveniently on the platform. The platform has a forward and reverse travel of 98 inches. Features of the unit include; its own 24 volt power supply, an 80 gallon water system, an electrical outlet, and in addition operates a full 8 to 12 hours before the battery needs recharging.

Circle 326 on Reader Service Card

Fits Most 4-Wheel Tractors

A new line of tractor-mounted front end loaders is announced by Superior Equipment Division of Superior Pipe Specialties Co. They can be mounted on most models of low-silhouette four-wheel tractors. The loaders feature a new extra-strong tubular frame, part of which acts as an hydraulic reservoir.

Circle 327 on Reader Service Card

Try NEW Bond® 50-A SERIES
PRESSED STEEL SWIVEL CASTERS
...they're stronger, lighter and lower cost!

A new ball race, deeply embossed outer apron and steel sleeve put *extra* strength at the *right* places on Bond's new 50-A Series Pressed Steel Swivel Casters. This means you can expect *and get* long, dependable service from your 50-A's. They'll roll with "air-light" ease. And they'll cost less to buy, less to use.

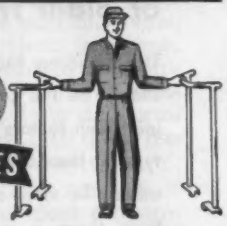
Try new Bond 50-A Series Pressed Steel Swivel Casters. They are available in 2, 2½, 3, 4, 5 and 6-inch diameter semi-steel or solid rubber tread wheels. Individual caster capacities range from 75 through 500 pounds. Buy your new Bond 50-A Series Pressed Steel Swivel Casters from your local Bond distributor or write:

Bond FOUNDRY
& MACHINE COMPANY
MANHEIM, PENNSYLVANIA

Circle 24 on Reader Service Card for more information

CONVERT YOUR REGULAR PALLETS INTO MOVEABLE RACKS

TIER-RACK
TRADEMARK REGISTERED
PALLET STACKING FRAMES



EASY TO ASSEMBLE IN SECONDS BY ONE MAN . . . JUST SNAP ON YOUR PRESENT PALLETS!

The TIER-RACK system consists of a set of *2 identical, interchangeable frames* that easily snap on your standard wood pallets and lock into place. There are no "rights" or "lefts", no nuts, bolts, extra hardware or special attachments.

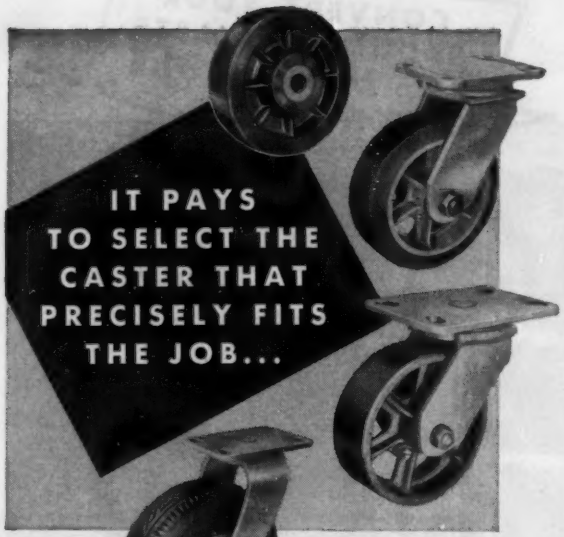
TIER-RACKS eliminate damage by compression . . . Allow selectivity in order picking without disturbing load above . . . Are ideal for palletizing irregular shaped items, or production work-in-process.

Write for literature

PAT. PEND.

TIER-RACK CORPORATION
122 NORTH SEVENTH ST. ST. LOUIS 1, MO.
For EAST and SOUTHEAST, PLEASE ADDRESS INQUIRIES TO
TIER-RACK SOUTHERN CORPORATION
855 AVENUE OF THE AMERICAS, NEW YORK, N. Y.
ALSO ELLIJAY, GA.

Circle 176 on Reader Service Card for more information



Saginaw
CASTERS

designed to meet the specific conditions in nearly every kind of plant transportation.

The deciding factor in your choice of casters should be the conditions they will face on the job. Such factors are quietness, vibration, load, type of floor and permissible wear and several others. To meet almost any given set of conditions there is a Saginaw Caster specifically engineered and constructed. When you need casters it will pay you to get the size and type that are exactly right.

OTHER SAGINAW MATERIALS HANDLING EQUIPMENT

Write today for your copy of Saginaw Casters and Wheels (Catalog No. C-56) or Saginaw Pneumatic Wheels (Catalog No. W-57)

SAGINAW PRODUCTS CORPORATION 54

SAGINAW 2, MICHIGAN

Circle 139 on Reader Service Card for more information

NEW EQUIPMENT SECTION

Sweeper Has Power Dumping

A new large-capacity power sweeper that dumps hydraulically has been developed by the G. H. Tennant Co. Designated the Model 80, it is specially designed to cover a 53-inch path (with side-brush) and reportedly sweeps up to 110,000 square feet an hour in open areas. At the touch of a lever, the sweeper can dump loads of up to 800 pounds in 10 seconds. According to the manufacturer, brushes can be changed in as little as 5 minutes.

Circle 328 on Reader Service Card

Aisle Markers

Aisles, lanes and parking spaces can be marked with the new self-sticking "Dotted Line" aisle markers and directional arrows, manufactured by W. H. Brady Company. They are made of durable, colorful, vinyl plastic, backed with a heavy duty adhesive. No moistening or drying time is required. The markers are .005 inches thick and lie flush with the floor or pavement. According to the manufacturer, oil, grease,

BRONCO MAGNESIUM

Bridge Ramps

Quality Built Economy Priced

Here's the right answer to every truck or car loading problem . . . Bronco Bridge Ramps. Quality constructed, Bronco's exclusive design gives you greater strength, longer service and added safety features. Find out about all the Bronco features today...you'll be surprised at how economically they are priced.

*Low initial cost . . . lifetime service
*Maximum strength . . . minimum weight
*Safety tread surface . . . positive locking device
*Side guards . . . designed to prevent run-off or tire damage
*Carloading or Truck ramps . . . 1000 to 12,000 lb. capacities

Write For Illustrated Brochure

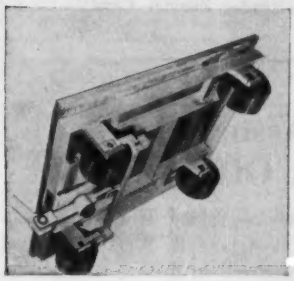
BRONCO PRODUCTS COMPANY
717 Stanford Avenue • Los Angeles 21, California

Circle 26 on Reader Service Card for more information

water and floor cleaning compounds have no effect on the markers, and they will outlast painted lines 5 to 1.

Circle 329 on Reader Service Card

Lo-Hite Express Roller Platform Truck



A new heavy duty truck which has a new style free-floating roller and ball bearing wheel has been introduced by the Hilman Equipment Company. It is available in capacities from 3000 to 24,000 pounds, and is made in overall heights of 9-¾ and 11-¾ inches. The ball bearing wheels permit friction free turning. Checkered steel or hardwood, enclosed in steel frame, platforms are available.

Circle 330 on Reader Service Card

GS Approval for Industrial Trucks

Yale Material Handling Division, The Yale & Towne Manufacturing Company, has announced the acquisition of GS approval on its entire line of gasoline engine trucks. According to specifications and recommendations prescribed by the National Fire Protective Association, GS trucks are the only gasoline trucks which can be safely used in locations defined as

The RACK

HYDRAULIC UTILITY TABLE

Combination of variable working height and reinforced top provides multiple use with dies, at presses, shears and other industrial applications.

SPECIFICATIONS

- 1000 lbs. capacity
- Table top .....20"x 26"
- Base .....20"x 26"
- Lowered Height .....29½"
- Elevated Height .....45"
- Elevation .....15½"
- Equipped with 4 ....4" Steel Casters 2 Rigid and 2 Swivel

FLEXIBILITY GUARANTEED

Only $200.00

F.O.B. Connellsville, Pa.

HUNDREDS OF APPLICATIONS

Write for bulletin today—Model 11044—Made in U.S.A.

RACK HYDRAULIC EQUIPMENT CORPORATION

131 SIXTH ST., CONNELLSVILLE, PA.

Plants: Connellsville, Pa. • Gardena, Calif. • Farnham, Canada • Slough, England

Circle 122 on Reader Service Card for more information

HOW ANTHONY LIFT GATE cuts costs for STATE FARM INSURANCE COMPANIES

***Saves manpower and time with deliveries of equipment**

Until recently, it took four maintenance men to move a desk from the State Farm warehouse to the State Farm office building. Now, only two men do the same job in less time. The difference is the addition of an Anthony Lift Gate on the back of State Farm's trouble-shooting truck. Now making daily deliveries for State Farm, the Anthony Lift Gate has already paid for itself several times over.

It provides the most efficient method of loading and unloading . . . the most economical way to move all types of equipment 4½ ft. up and 4½ ft. down at the back of a truck.

Now available for capacities up to 4000 lbs., the Anthony Lift Gate gives unmatched performance. Just one lever controls all gate operations from either side of the truck. Gate automatically stops if driver takes hand off lever. It will not operate if overloaded and cannot possibly crash the load. Many other features. Descriptive literature is available at no obligation.

Buy the tail gate that has the service

Anthony Distributors are located from coast to coast ready to help you solve your delivery problems. Write today for a complete Anthony Distributor list.

ANTHONY 5-POINT PLAN TO LOWER DELIVERY COSTS

- Increase the number of deliveries and reduce fixed costs per delivery.
- Strengthen reputation for faster, improved service.
- Increase earning time of trucks and earning power of men.
- Cut standing time waiting for consignee help.
- Reduce the danger of damaged goods (and disgruntled consignees).

ANTHONY COMPANY

STREATOR, ILL.

Circle 11 on Reader Service Card for more information

hazardous because of the presence of combustible fibers or flying or hazardous gases and liquids being stored and handled in closed containers. One of the new developments to meet GS standards is the development of a special designed exhaust flame arrester made up of 64 finely separated stainless steel plates. Yale trucks also have a generator and battery cutout switch easily accessible to the operator so that the full electrical circuit can be broken in case of emergency. Other features of the firm's GS lift trucks are totally enclosed generator and starting motor, shielded safety fuel fill cap, and a protected gas tank.

Circle 331 on Reader Service Card

Improved Multiple Packaging System

A new high speed multiple can packaging system has been introduced by the Robert Gair Division of Continental Can Company, under the name Jak-Et-Pak. The new system is described by the manufacturer as versatile and compact. It employs an automatic packaging machine and a carrier carton which wraps around the cans from the top down, and not only glues but also locks on the bottom. Wrapping from the top down makes it possible to package not only flat-top but also crown-top and spout-top cans. Jak-Et-Pak handles cans ranging in height from 2⅝ to 7¾ inches, and in diameter from 2⅛ to 3¾ inches. It operates at speeds up to 120 carriers per minute.

Circle 332 on Reader Service Card

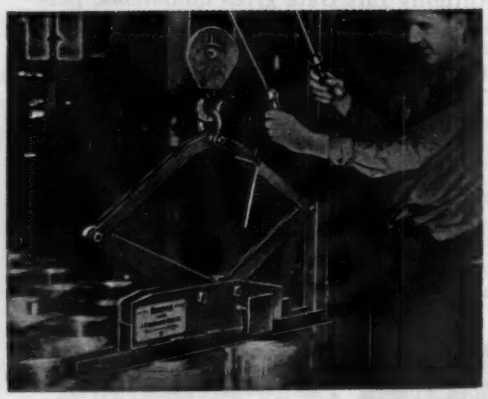
Hoist Association Elects Officers

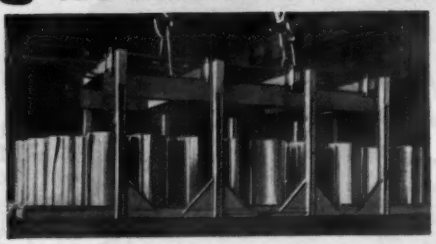
President of the newly-organized Hoist Manufacturers Association, Inc. is Arland R. Walkey, general manager of Manning, Maxwell & Moore, Inc. Milton L. Aitken, general sales manager of Robbins & Myers, Inc., was named vice president, and Joe H. Peritz was elected executive secretary and treasurer. Directors of the new organizations are: Carl O. Hedner, assistant general sales manager, The Yale & Towne Manufacturing Company; William C. Miles, vice president, American Engineering Company; and William S. Armington, Sales Manager, The Euclid Crane & Hoist Company. The HMA succeeds the Electric Hoist Manufacturing Association, and will conduct a series of programs related to safety, simplification and statistics, to better serve its members and the user industries. Next meeting of the organization will be on May 16, in the Mayflower Hotel, Washington, D. C.

MANSAVER® GRABS Are Made for YOUR Industry

These Are For The

ALUMINUM INDUSTRY





STYLE 1142 (above) is a Mansaver Grab with a capacity of 100 tons. It is easily operated by one man, or comes motor-driven for cab operation. Used in many of the great aluminum plants of America.

MANSAVERS PREVENT ACCIDENTS and Production Delays

Shown at the right is another Mansaver Grab of basic 1142 type for handling extrusions in racks. Racks may be of varied widths. One rack can be handled by itself or it can be placed on another, so that two or three racks can be handled simultaneously. Send for catalog.

STYLE 1145 (above) is used for handling coils vertically, either finished or unfinished, and either singly or two at a time, at many production locations. It is built in two types, single-acting and double-acting, and is used for handling aluminum, also brass and steel.

★ MANSAVER INDUSTRIES, INC., 3103 EAST ST., NEW HAVEN, CONN. ★

Circle No. 99 on Reader Service Card for more information

CLASSIFIED ADVERTISING SECTION

USED EQUIPMENT—MEN—JOBS—LINES

Rates: for "Positions Wanted" $8.00 minimum, limit 25 words. For all other classifications $10.00 minimum for 25 words; each additional word 25c. Boldface type or all caps, $12.00 minimum for 25 words, each additional word 35c. Box address counts as five words. All insertions payable in advance.

LINES WANTED

Manufacturer's Agent. Northern New Jersey wants lines for agressive promotion in this area. Joseph McCoart, 518 Main St., Boonton, N. J.

Material Handling Equipment and allied lines wanted for St. Louis area. Sales and service facilities for gas, electric and hydraulic lift trucks. Well established with industrial, warehouse and transportation accounts. Have 10,000 square feet of showroom, shop and warehouse space. Write c/o FLOW, Box 5257.

HELP WANTED

TO WORK IN SOUTHERN CALIFORNIA

For plant layout and estimating work involving automatic package conveying systems, automatic warehousing, segregating, pallet loading and unloading equipment. Live within 15 minutes drive to plant in Riverside, California, (60 miles southeast of Los Angeles.) Enjoy interesting and varied work on non-governmental projects. Liberal fringe benefits-vacations, paid life and hospitalization insurance, sick leave, retirement program. Send written resume of education, previous experience, and salary to: E. A. Verrinder Chief Engineer

FOOD MACHINERY & CHEMICAL CORP.
PACKING EQUIPMENT DIV.
P. O. BOX 552
RIVERSIDE, CALIFORNIA

REPRESENTATIVES WANTED

To handle line of engineered conveyors. Established manufacturer introducing line of unusual conveyors. Leads furnished. Exclusive territory. Commission. Write today. FLOW Box 5157

AAA1 manufacturer of traveling cranes, jib cranes, etc., wants active representation in Baltimore, Philadelphia, Connecticut, Massachusetts, Milwaukee and Springfield, Illinois areas. Commission basis. Address c/o FLOW, Box 5357.

HYDRO CLAM SCOOP
DESIGNED for INDUSTRIAL FORK TRUCK USE
Blade without sides is easily pushed under any material. Removable dog-toothed clamping bar for handling fibrous material. Side plates furnished for handling granular material.

PICK-UP POSITION
With side plates

CARRYING POSITION
With dog-toothed clamping bar

45° DISCHARGE

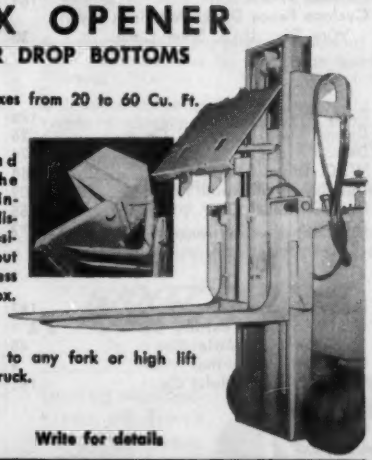
MTC HYDRAULIC INDUSTRIAL TRUCK ATTACHMENTS

HYDRO
BOX OPENER
FOR DROP BOTTOMS

Opens Boxes from 20 to 60 Cu. Ft.

Lifts and opens the box. Maintains lip discharge position without undue stress on the box.

Adaptable to any fork or high lift platform truck.

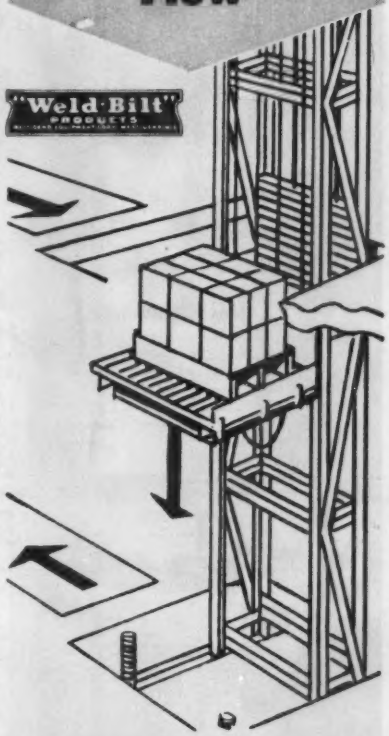


Write for details

MATERIALS TRANSPORTATION COMPANY
5429 W. Diversey Ave. • Chicago 39, Ill. • BErkshire 7-7101

Circle No. 175 on Reader Service Card for more information

NEW... for Floor-to-Floor Production Flow



Weld-Bilt
VERTICAL TRANSPORTATION

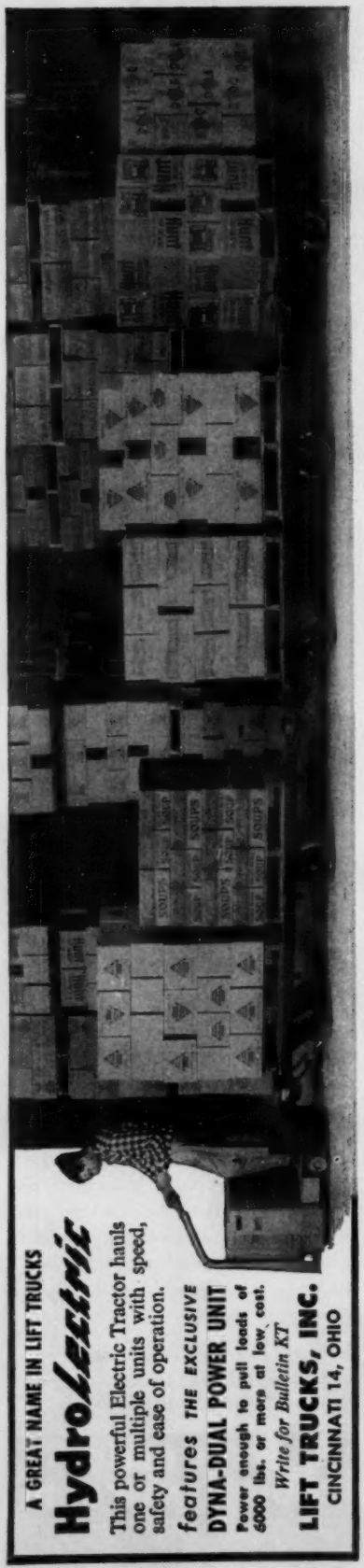
Here's conveyor automation between floors — one, two, or three floor levels — with minimum remodelling. Automatic loading, unloading, lifting or lowering to match conveyor speed. Controls, brakes, switches, platforms — all engineered to your needs.

Write for profitable suggestions on your own floor-to-floor conveyorizing with Weld-Bilt "Vertical Transportation"

WEST BEND EQUIPMENT CORP.
MATERIALS HANDLING ENGINEERS
335 Water Street • West Bend, Wisconsin

Circle No. 167 on Reader Service Card

ADVERTISERS


A GREAT NAME IN LIFT TRUCKS
HydroElectric
This powerful Electric Tractor hauls one or multiple units with speed, safety and ease of operation.
features THE EXCLUSIVE
DYNA-DUAL POWER UNIT
Power enough to pull loads of 6000 lbs. or more at low cost.
Write for Bulletin KT
LIFT TRUCKS, INC.
CINCINNATI 14, OHIO

A B C Packaging Machine Corp. 128
Acme Steel Co., Dexion Div. 91
Acme Steel Co., Steel Products Div. 125
Allis-Chalmers Mfg. Co., Buda Div. 54 & 55
Allis-Chalmers Mfg. Co., Construction Machinery Div. 141
Alvey-Ferguson Co. 162
American Chain & Cable Co., Inc. Wright Hoist Div. ..... 98 & 99
American Engineering Co. 24
American Metal Products Co. 9
American MonoRail Co. 142
American Pulley Co. 178
American Sisalkraft Corp. 115
Anthony Co. 193
Appleton Electric Co. 53
Armstrong Bray & Co. 184
Ashworth Brothers, Inc. 166
Austin-Western Works 25
Automatic Transportation Co. ..... 38 & 39
Auto-Nailer Co. 132

Baker-Raulang Co. 2
Barrett-Cravens Co. 190
Bathey Mfg. Co. 184
Baughman Mfg. Co. 179
Belt Corp. 187
Bigelow-Garvey Lumber Co. 152
Big Joe Mfg. Co. 94
Bond Foundry & Machine Co. 191
Brainard Steel Div., Sharon Steel Corp. 113
Bronco Products Co. 192
Bucyrus-Erie Co. 5
E. W. Buschman Co. 20

C & D Batteries, Inc. 62
Cady Metal Fabricating Co. 166
CAPCO 130
Chainveyor Corp. 15
Clark Equipment Co., Industrial Truck Div. 17, 19, 97
Clipper Belt Lacer Co. 12
Coles Cranes, Inc. 160
Convoy, Inc. 189
R. H. Corbett & Co., Ltd. 183
Cullen-Friestedt Co. 176
Cullman Wheel Co. 164
Cyclone Fence Dept., American Steel & Wire Div., U. S. Steel Corp. 30

Dazzo Products Co. 126
Deluxe Metal Furniture Co. 26
Detroit Hoist & Machine Co. 174
W. C. Dillon & Co., Inc. 188
Douglas Fir Plywood Assoc. ..... 108 & 109
Dow Chemical Co. 155
Duo-Fast 112

Economy Engineering Co. 182
Electric Storage Battery Co. ..... 6 & 7
Elwell-Parker Electric Co. 45
Equipment Mfg., Inc. 4
Euclid Crane & Hoist Co. 181

Fab-Weld Corp. 198
Fastener Corp. 112
Faultless Caster Corp. ..... Inside Front Cover
Dave Fischbein Co. 131
Flexangle Corp. 198
Frick-Gallagher Mfg. Co. 159

Gar Wood Industries, Inc. 22
General Box Co. ..... 104 & 105
General Electric Co., Gear Motor Div. 18
Gerrard Steel Strapping Div., U. S. Steel Corp. 127
Gifford-Wood Co. 28
Goodall Rubber Co. 44
B. F. Goodrich Tire Co. A Div. of the B. F. Goodrich Co. 176
Goodyear Tire & Rubber Co., Inc. 1
Adolph Gottscho, Inc. 118
Gould-National Batteries, Inc. 147

Hamilton Caster & Mfg. Co. 149
Hapman Conveyors, Inc. 176
Harnischfeger Corp. 165
Hewitt-Robins 96
Frank G. Hough Co. ..... 92 & 93

I. T. D., Ltd. 177
Ideal Stencil Machine Co. 128
Industrial Crane & Hoist Corp. 21
Industrial Marking Equipment Co. 130
Ingersoll-Kalamazoo Div., Borg Warner Corp. 157
International Paper Co., Bagpak Div. 102
International Staple & Machine Co. 114
Ironbound Box & Lumber Co. 182
Island Equipment Corp. 189

Joy Mfg. Co. 58

Kalamazoo Mfg. Co. 170

Lamson Corp. 13
Lamson-Mobilift Corp. 57
Landahl Conveyor Co. 143
Lansing Co. 185
Lee Engineering Co. 184
R. G. LeTourneau, Inc. 178
G. B. Lewis Co. 172
Lewis-Shepard Products, Inc. 47
Lift Trucks, Inc. 196
Loomis Machine Co. 186

Magline Inc. ..... Inside Back Cover
Manning, Maxwell & Moore, Inc. 33
Mansaver Industries, Inc. 194
Martin-Decker Corp. 198
Materials Transportation Co. 195
May-Fran Engineering, Inc. 42
McGraw-Edison Co. 158
Mercury Industries, Inc., Pulley & Roll Div. 182
Mercury Mfg. Co. 27
Merrill Brothers 186
Metzger Conveyor Co. 188
Micron, Inc. 174
Mid-States Gummed Paper Co. 131
Moto-Truc Co. 95
Multistamp Co. 128

National Metal Edge Box Co. 100
Neiman Steel Equipment Co., Inc. 172
Nolan Co. 130

Ohio Galvanizing & Mfg. Co. 198
Omic, Ltd. 187
Oxy-Catalyst, Inc. 180

Circle No. 93 on Reader Service Card

INDEX

Palmer-Shile Co. 163
Paltier Corp. 32
Penco Engineering Co. 178
Penco Metal Products Div., Alan Wood Steel Co. 148
Powell Pressed Steel Co. 173

Rack Hydraulic Equipment Corp. 193
Radio Corp. of America 161
The Rapids-Standard Co., Inc. 146, 174
The Raymond Corp. 40, 41
Ready-Power Co. 150
Republic Steel Corp. ..... 60 & 61
Revolvator Co. 166
Rexford Paper Co. 124
Richards-Wilcox Mfg. Co. 197
Robbins & Myers, Inc., Hoist & Crane Div. 134
Robbins & Myers, Inc., Pump Div. 23
John A. Roebling's Sons Corp. 151
Roura Iron Works, Inc. 26

Saginaw Products Corp. 192
Schield Bantam Co. 43
Shepard Niles Crane & Hoist Corp. 14
Signode Steel Strapping Co. 107, 130
Southworth Machine Co. 29
Speedry Products, Inc. 126
Standard Conveyor Co. 156
Standard Pressed Steel Co. ..... 144 & 145
Sterling Wheelbarrow Co. 172
Streeter-Amet Co. 190
Sturdi-Bilt Engineering Co. 154

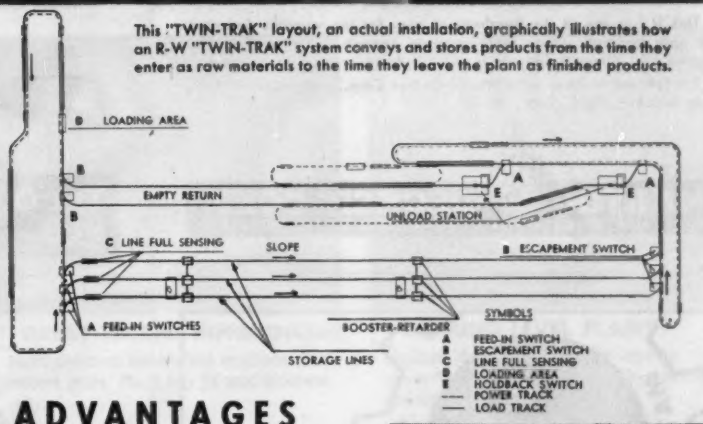
G. H. Tennant Co. 8
Thew Shovel Co. ..... 168 & 169
Thomas Truck & Caster Co. 180
Tier-Rack Corp. 118, 191
Timken-Detroit Brake Div., Rockwell Spring & Axle Co. 167
Tokheim Corp. 180
Towmotor Corp. 11
Tractomotive Corp. 153

Union Metal Mfg. Co. 140
Union Special Machine Co. 109
Union Steel Products Co. 16
Universal Clamp Co. 189
U. S. Rubber Co., Industrial Tire Div. 37
U. S. Rubber Co., Footwear Div. 123

Vickers, Inc. 31

John Waldron Corp. 10
Walz & Krenzer, Inc. 164
Weber Marking Systems Div., of Weber Addressing Machine Co. 133
West Bend Equipment Corp. 195
Wilshire Power Sweeper Co. 56
Wirebound Box Mfrs. Assn. 129
Wright Hoist Div., American Chain & Cable Co., Inc. ..... 98 & 99

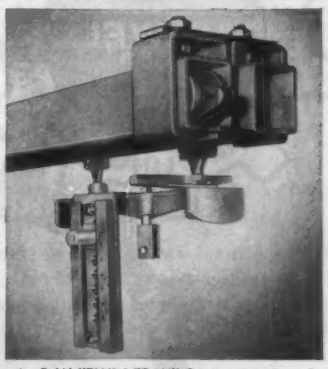
Yale & Towne Mfg. Co. ..... 49, 50 & 51
Young Machinery Co. 164
Youngstown Steel Door Co. 175



This "TWIN-TRAK" layout, an actual installation, graphically illustrates how an R-W "TWIN-TRAK" system conveys and stores products from the time they enter as raw materials to the time they leave the plant as finished products.

ADVANTAGES

- Provides trouble-free, automotive-selective control over product movement through entire plant.
- Economical and practical . . . provides added storage space . . . saves time, labor and money.
- Automatically supplies component parts to work stations from storage banks or lines.
- Economical to install . . . extremely flexible . . . quickly and economically revised or modified to meet your changing needs or future expansion plans.
- Ideal for conveying and dispatching products in multiple story buildings.
- Designed, manufactured and backed by the leading firm in this field for over 75 years.



An R-W "TWIN-TRAK" System consists of one or more power tracks and as many storage or free tracks as desired. Available with efficient, economical manual or electronic selective controls designed to effectively meet your specific requirements.

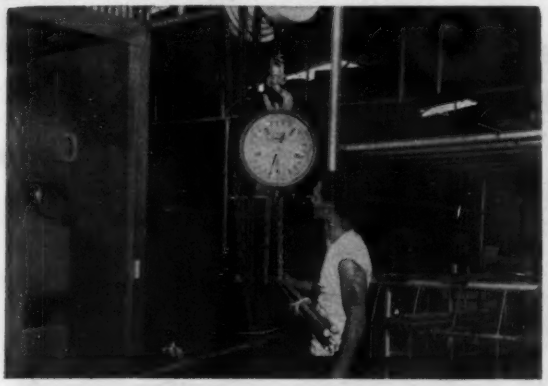
WRITE TODAY
for complete information . . . request Catalog F-192.

Leading manufacturer of Track Hangers, all types of hardware and Electric Door Operators for over 75 years.

Richards-Wilcox
MANUFACTURING COMPANY
Materials Handling Division

420 W. THIRD STREET, AURORA, ILLINOIS BRANCHES IN PRINCIPAL CITIES
Circle No. 132 on Reader Service Card for more information

Circle 110 on Reader Service Card for more information



DO YOU ALWAYS GET YOUR MONEY'S WORTH WHEN YOU BUY BAR STOCK?

You buy bar stock by the pound, but do you always get what you pay for? The simplest way to find out is to weigh it as you receive it with a Martin-Decker SU-20 Sensater hook scale.

This is but one of the hundreds of uses for the versatile Sensater, the only hydraulic crane scale accurate enough to be certified, yet rugged and compact enough to meet industry's exacting demands.

For full particulars, write Martin-Decker Corp., 3431 Cherry Ave., Long Beach 7, Calif., Dept. N-16.

MARTIN·DECKER CORP.

HOME OF THE WEIGHT INDICATOR — LONG BEACH, CALIFORNIA

Circle 114 on Reader Service Card for more information

OHIO GALVANIZING & MFG. CO.

Industrial TRUCKS and TRAILERS

"Ohio" Trucks and Trailers—in various sizes and capacities—meet many material handling requirements, in different industries. Both standard and specially-designed units offer you sturdy construction, and long, continuous service at minimum cost.

Contact "Ohio" today for free literature and complete details.

4 Wheel Steer
15 ton capacity.
60" wide x 192" x 33" high.

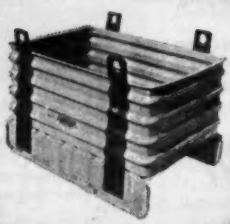
THE OHIO GALVANIZING & MFG. CO.

NILES · · Established 1902 · · OHIO

FAB-WELD CORPORATION

MATERIALS HANDLING EQUIPMENT

SAVES TIME . . . MONEY . . . LABOR!



FAB-WELD CORPORATION

Write Dept. F-5 for new catalog illustrating the complete Fab-Weld line.

SIMPSON, LACKAWANNA COUNTY, PENNA.

Circle 185 on Reader Service Card for more information

stocks high?
space tight? labor short?

solve the problem with

FLEXANGLE

UNIVERSAL SLOTTED ANGLE SYSTEM

Easy-to-erect—Efficient—Economical

Ready for use by anyone, for any purpose, anywhere!

Pre-painted enameled finish steel, fire-resistant, rustproof . . . pre-slotted, measure-marked, can be cut or joined at ¾" intervals for exact size in desired shape without waste . . . no drilling, no welding, just cut and bolt . . . 3 bolts in bearing at every joining make it rigid . . . disassembles easily, stores compactly, can be reassembled in new form. A practical solution for in-plant structure problems.

Authorized distributors in all principal cities carry stocks for immediate delivery. Write for information bulletin TODAY.

FLEXANGLE CORPORATION

280 Park Road • West Hartford 7, Connecticut

Distributors: *some territories open*

Circle 59 on Reader Service Card for more information

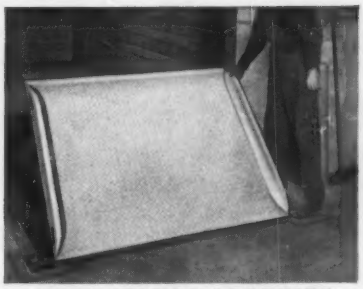
WHICH OF THESE DOCK LOADING PROBLEMS IS YOURS?

☐ **TRUCK DOCK?**

Magliner dock boards meet today's cost-saving requirements for fast, efficient truck-trailer loading. Boards are magnesium-light for safe, easy one man handling.

☐ **RAIL DOCK?**

Curved tracks, reefer cars, varying dock-to-car spans, door widths, etc. All pose specific problems—quickly solved with a Magliner dock board.



☐ **MULTI-STATION LOADING?**

Magliner Perma-Docks—a permanently installed leveling system . . . recessed into dock. One man easily raises or lowers board. Power operation optional.

☐ **CROWDED, NARROW DOCK?**

Magliner flared dock boards permit sharp turns in crowded, narrow areas.

☐ **GREAT HEIGHT DIFFERENCES?**

Board-and-ramp combination lengthens slope, reduces grade. Board may be used independently.

☐ **GROUND LEVEL PLANT?**

Magliner Mobile Loading Ramp services rail cars or truck trailers. A loading dock on wheels. One man moves it!

You can quickly, safely and easily solve it with a MAGLINER Magnesium Dock Board!

Is one of these loading problems yours? They are typical examples of how Magliner magnesium dock boards have provided practical cost-saving solutions to thousands of difficult dock problems.

Every dock is different . . . No two loading problems are exactly alike. Many variable factors, such as equipment, loads, plant layout, operating conditions, etc.—determine which Magliner dock board will meet *your* specific requirement, and do your job best! Whichever Magliner dock board is recommended for your operation, it will speed loading . . . get more out of power trucks and other loading equipment . . . keep costs down and output up! It will have all the outstanding design and construction advantages which have made Magliner a recognized authority in this highly specialized field.

Magliner dock boards are light . . . strong . . . safe! Made of magnesium for easy, one man handling, they safely handle loads up to 20,000 lbs., protect men and equipment against accidents and costly damage.

A low-cost investment, Magliner dock boards provide dependable, long-life service with less maintenance, and will pay you big dividends over a long period of time. Ask for the facts today—***write for Bulletin DB-204.***

Mag Liner MAGNESIUM DOCK BOARDS

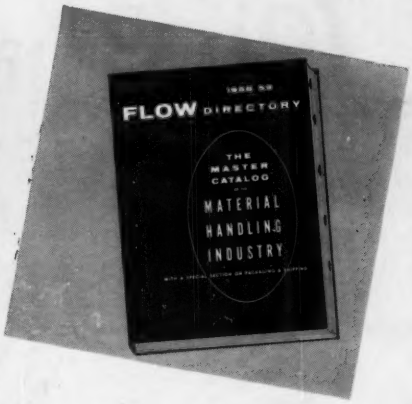
MAGLINE INC. • P. O. BOX 25 • PINCONNING, MICH.

Canadian Factory: Magline of Canada, Ltd., Renfrew, Ontario

Circle No. 95 on Reader Service Card for more information

Only The Big "FLOW PACKAGE"

completely blankets the entire buying group of material handling, packaging and shipping equipment and supplies



. . . with over 155,800
Franchise - Paid Circulation

FLOW (Monthly)

■ FLOW Magazine reaches more than 40,000 high volume, repetitive buyers. These men account for the purchase of 70% of all material handling, industrial packaging and shipping equipment and supplies.

Material Handling Illustrated (Quarterly)

■ For mass market coverage, Material Handling Illustrated gives you more than 98,260 additional buyers who account for the remaining 30% of the total market.

FLOW Directory & Master Catalog

■ Continually covering the hard core of big volume users (and buyers) of material handling equipment, the Flow Directory is used by 14,500 companies.

	Flow	Material Handling Illustrated	Directory & Master Catalog
CIRCULATION	40,437	100,928	14,500

Quality Readership: Only with the Flow family of publications do you get complete coverage of men who buy or influence the purchase of material handling, industrial packaging and shipping equipment and supplies, *regardless of title.*

Editorial Leadership: Outstanding editorials exclusively devoted to material handling, industrial packaging and shipping make the Flow Package preferred reading among men who must be sold.

FLOW • MATERIAL HANDLING ILLUSTRATED

Material Handling Industry Directory & Catalog

Publications of Industrial Publishing Corporation

812 Huron Road • Cleveland 15, Ohio

Cleveland — SU 1-9622 • New York — MU 7-3420
Chicago — WH 3-1655 • Los Angeles — DU 7-5104 • Ft. Lauderdale — LU 3-3659